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## DIFFICULTY OF ADJUSTMENT DURING THE ADOLESCENT PERIOD\*

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According to the last available Federal Census of the Insane, there were, in 1922, 258,421 patients on the books of the state hospitals for the insane in the United States, 73,000 of these being first admissions and 160,000 re-admissions. There was an average increase of 9,000 per year since the census ten years earlier. Of this vast army 23 per cent had been discharged as *recovered*. Of the remaining, 46 per cent had been discharged as improved, while the remainder were left in the hospitals as custodial charges of the public until death solved the problem.

This group of mental troubles requires more beds than all other groups of diseases. If all the defectives, delinquents, dependents and criminals were added together their combined total would not equal the number of insane under treatment.

To bring the problem of caring for and eliminating the causes of insanity directly to the people (those who pay the enormous bill) I am going to depart from a strictly medical paper and, if possible, give one that can be readily understood by those who have not studied medicine.

Therefore, I am going to state briefly that all mental diseases can first be divided into two great classes—Organic Insanities and Functional Insanities. The organic insanities are those in which there is an injury to the brain or the spinal nerve centers, and, since nervous tissue does not replace itself, no cure can be effected. The process of repair necessitates scar tissue, which interferes with the normal function. The only thing that can be done with organic insanity is at best to sometimes stop the progress of the

disease and to keep the patient comfortable until death. On the other hand, theoretically speaking, all functional insanities should be curable, provided we know enough to determine the cause and to remove it. It is needless to point out that the 23 per cent recovered and the 46 per cent improved are in this functional group.

One of the most startling facts to the layman is the absolute certainty that about 60 per cent of all functional insanities are preventable:

1. There are 5 per cent of insanities due to alcohol. Judicious use of good spirits would entirely remove this disease.

2. One per cent of insanities is due to drug addictions—morphine, cocaine, etc. Non-use of these drugs as a stimulant would abolish nearly 3,000 cases a year.

3. Fifteen per cent of all cases are syphilitic insanities, and, while there are some cases of syphilis innocently acquired, we all know that the great source of this trouble is promiscuous sexual relations. A better standard of morals would eliminate this disease.

4. Of the functional cases the two large groups are the manic and the precox—the first being about 15 per cent and the latter 25 per cent of all admissions. These two groups are those that make up the bulk of our population, and while at present the manic group is quite hopeful from the standpoint of recovery the precox group is very stubborn to treatment and so far is considered quite hopeless—for the greater percentage of them remain in the hospitals until death.

When you look into the causes of insanities of the functional type you find many and various causes given. Two of the most prominent are hereditary and environmental influences; in plain words, traits that we are born with, and the influence of our surroundings and training, especially during our early years.

Everyone's present position in life is due to his adjustment to his surroundings or environment. The whole life of an individual can be summed up into three fundamental actions of his

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central nervous system. No matter how high or how low a position in life any individual person occupies, three things are essential: (1) a knowledge of his environment must be gained; (2) this knowledge must be brought into relation with previous experiences; and (3) the knowledge gained and associated must be transferred into appropriate actions.

Let us for a moment consider the infant just born—thrown into the world without its consent by the strongest urge planted in man by God Almighty. The infant is here because God ordained that we should reproduce our kind. Within a few short years this gift of heaven, helpless, innocent, pure as a flower, can be developed into an individual destined to be of great benefit to society, or on the other hand to be a source of sorrow and a spreader of corruption to all with whom he comes in contact. Aside from accidents, his destiny will be decided by his adjustments to his surroundings, his interpretations of the stimuli received during all of his life, but most especially during the formative years up to and including his adolescence.

Just for a moment let us see how all of us arrived at our present place in society. Each of us started as an infant, and our position is due to our adjustment to our environment, plus certain inherited qualities and absence of accidents. The senses give us our knowledge of our environment. The intellect associates and compares impressions with previous knowledge. Volition or will carries out the judgment of the intellect in conduct. Immediately after birth the senses register knowledge of the new world to the infant. Sensations of light, heat, cold, pleasure and pain are poured in on the young brain, which is like a blotting paper, ready to absorb everything.

Perhaps you might think the first period of absorption of stimuli might continue some considerable time before the second step, association, and the third, action, based upon the first two steps, would occur. The truth is, very few sensations are registered before they are associated with those just previously received and in almost no time volitional acts are performed by the infant upon his very limited previous experiences. As an illustration perhaps the first volitional act of a child is to cry. Every mother can tell you how quickly the baby learns to associate attention and care with the act of crying. In a month

a baby can be a tyrant in a home. He soon learns whether his father will be his slave, walking the floor at night for his amusement, or whether the father will pay no attention to him. The infant can just as readily be taught that crying will not bring coddling, provided the baby had the good sense to pick parents of sound judgment, and there are not grandmothers too near at hand.

Good or bad habit associations can be formed very early in life and the earlier and more constantly correct associations are registered, the less difficulty there will be in shaping a child's adolescence. The years preceding puberty are the great formative period of our lives. Everyone knows the truth of the saying of Pope: "Just as the twig is bent the tree's inclined." Yet, many of us are negligent of our children during the years spent in grade schools and shift to school teachers, Y. M. C. A., Boy Scouts and other organizations the responsibilities which should be borne by ourselves. All of these agencies work diligently for the betterment of children and accomplish much good, but they only have the child during a few hours and unfortunately social habits of the parents leave little time for home life. We all know that the family is the only stable unit of society and in the home should be taught honesty, morality and discipline. There is no need to point out to you that you cannot teach honesty in a home by maxims and lectures delivered to children who see dishonest acts committed by parents or hear sharp practices discussed wherein one relates how he overreached another in business by cunning scheming. The child sees directly and he thinks straight and he learns hypocrisy, and his immature mind believes that not to be caught is the main thing to guard against. So it is with morality; maybe the boy or girl, instead of being in company with parents, spends leisure time with vicious associates. Many reports of juvenile offenders show that boys and girls from ten to twelve years of age have been guilty of immoral practices taught them by older school children. A boy or girl of 10 or 12 knows enough to realize that he is doing wrong but not enough to understand what the consequences of such actions may be. Let no mother be led astray by false modesty and not tell her young daughter the mysteries of child-bearing. If she has not mentioned it to her daughter of 10 years or so

she may be astounded to learn what vicious knowledge the daughter has picked up. If the mother has the child's confidence this can always be corrected before permanent harm is done. It is sometimes too late to talk of these things in adolescence when the urge of reproduction is surging through the veins. These desires and feelings are normal and are not to be repressed but curbed and directed by religious training. The boy, too, has his temptations and how many fathers realize the stuff their sons' wide-open ears hear from the hired men about the place? If you do not know what he will hear spend an hour or two among the weak, shiftless, unsuccessful men in a strange town. Maybe your position in your own town prevents your hearing much, but go into a community where you are not known and you will hear there what your boy hears when he hangs around the depot. In the boy's mind are many questions which he is diffident about asking his father. The father should broach such subjects to his son and not let him go into high school or even away to college without knowing what dangers immoral acts incur.

A word or two about discipline. No character can be built without discipline. No one can be successful in life until he has learned that there are certain rules and regulations of society which must be observed. The home has a similar relation to the child that society at large has to the adult. Definite duties and responsibilities should be laid down by the parents so that the child may learn before he goes out in the world that obedience to law and order will bring reward and peace of mind. The parent should, I believe, punish infractions of discipline involving lying, stealing and insubordination. The punishment may be either corporal or deprivation of privileges, depending upon the personality of the child. Speaking generally, there is too little punishment in the homes today and such punishment oftentimes is given out of pique. A mother not infrequently punishes a daughter for breaking a dish, a father chastises his son because he has to replace a window pane broken by a wild pitch. Such punishment is not fair and does great harm. In those situations where a stranger can do more with a child than the parents you will often find a history of such punishments.

It is true that corporal punishment does not always produce good results, and best results

are obtained only up to the age of 6 or 7 years. After that such punishment should always be avoided because the child knows that the parent is taking advantage of his ability and position as parent and he resents the dominating influence over his advancing growth of individuality and independence.

The reason that punishment must be different for different children is owing to the fact that roughly all of us may be divided, according to our personality, into two distinct classes of individuals. We are all extroverts or introverts. The extroverts find their thrill in life outside of self. They are the sociable personalities without traces of shyness, self-consciousness or awkwardness. They express their emotions freely and are responsive to the emotional feelings of others. They have the gift of charm. The introvert on the other hand gets his real thrill in himself before it is accepted or rejected. He is shy, silent, introspective. He frequently occupies himself with: What shall I do? What shall I accomplish? What of my future life after death? His emotions are reserved and it is difficult for him to express himself appropriately to the emotions of others. One can readily see that corporal punishment to introverts would be of great harm at any age, but especially in the formative years. A system of granting rewards or taking away privileges is the only reasonable method with such children.

To become successful citizens it is necessary that these two types of children build up character that will withstand the vicissitudes of life without becoming mentally deranged. Without a definite ideal or goal the extrovert will fall into the unreasonable conduct of the manic and the introvert develop into a shut-in precoc. Perhaps their divergence from normal behavior may not be so extreme as to be a mental disease but only develop into a wastrel or wanton if of extrovert type, while the introvert becomes the moody, eccentric crank.

Adolescence as you know is that transitional period beginning with puberty and extending to maturity. It does not begin at an exact age in all individuals but generally from 12 to 13 years in girls and from 14 to 15 years in boys. It is the most precarious period in their lives. Upon the associations and the adjustments made in these years will depend the success or failure of their whole future. We all know how many youths of both sexes during these years are a

sore trial to their parents and their community and how many, in spite of all that is done for them, turn out badly. We hope and hope that after each failure another trial and a fresh start will eventually find them adhering to the proper path. The failures are usually those that were neglected or allowed to get into bad habits during the formative years. Let us not talk about the delinquent youth but let us spend a few moments considering what the boys or girls have to meet and adjust themselves to in their adolescent years.

First the girl: In every normal girl's heart there is an inborn love of the beautiful and a desire to make herself attractive, an instinct planted there by the Creator as an adjunct to stimulate mating and the bearing of offspring. Mothers should, by their counsel and example, direct this tendency and keep it within the realms of modesty and economy. Different times have different ideas and customs; just now it is quite difficult for a mother to insist upon modest attire for her daughter when her own person is arrayed as dangerously seductive as possible. The young girl has a desire for boy companions, a normal desire, and provided the association is supervised, most beneficial to both sexes. The parent must, however, exercise greater caution now than a few years ago. The automobile is now to be reckoned with. To be at home at 9 or 10 o'clock a few years ago meant but a short buggy ride. Now, home at 10 or 12 means that the girl may have been 100 miles away from home influences, at most questionable public dances, in strange towns where no fear of being recognized easily removes a certain restraint. Parents should always know where their daughters are and in whose company they are. At the Cherokee State Hospital the cars that are driven out of the grounds by the night watchman invariably bear the license number of foreign counties. As daughter grows older, and perhaps has to work, be particularly solicitous that her female friends are not such as will tell her of so-called easy ways to enable her to wear expensive clothes though on a modest salary. Try and show her that true happiness lies in personal worth and not in material welfare purchased at such a great price. Soon she will arrive at these conclusions anyway, and your counsel and example will guide her until such time arrives. Few of us realize how many girls go astray through ignorance.

If she arrives at maturity without tarnish she will continue pure unless she deliberately and wilfully chooses to go to the bad, and such are very, very rare.

Now the boys: The boy during adolescence is a responsibility which oftentimes causes his parents grief and many gray hairs. His masculinity which begins to show itself dominates his actions and usually ruffles the temper of all who come in contact with him. The aggressiveness which will in later years, if properly trained, be turned into founding a home and protecting it is now manifested by turbulence and rebelliousness, and in order to attract the other sex he exhibits recklessness and braggadocio. While in this stage he is a hero worshipper although he carefully conceals it and would strenuously deny it if questioned. There is someone in the community or in the public print whom he secretly emulates and, so far as he can, imitates. Fortunate indeed for both parent and boy if this stage is passed under the guidance of some good manly football coach or physical director. He is now old enough to be told frankly by his father the dangers that lie in wait for him if he treads the Primrose Path. Illustrations may be found in almost any community of brilliant men who have been successful for a few years and then suddenly been cut down by paralysis or other obscure conditions, long before their time. He should know that these breakdowns may follow infections contracted years before by illicit sexual relations. Do not be afraid to be frank with him; he will eventually learn all of these things. He should be taught early so he can protect himself. During this stage the boy must be guided and mistakes condoned and corporal punishment discarded. Wise counsel, judicious praise and an establishment of companionship between father and son, even at the expense of club or lodge life, will do the most for the growing young man.

Both the boy and the girl should be encouraged to bring their friends to the home. This may cause some inconvenience but the parents should make this sacrifice so that they can supervise their companions and their pleasures without being too dictatorial. Every parent can readily discern whether someone brought to the home is undesirable and tactfully weed him out from the circle. It will take some effort to make the home the center of the amusements of the chil-



dren but you will be well repaid. Just now many children have all of their amusements and associations away from home and use home only as a place to eat and sleep.

In my talk I have been considering the average normal boy and girl. I have not touched upon the feeble-minded and subnormal. Such are another problem and must be dealt with in a different manner. However, it is well to bring to your mind that there are in physicians' offices and dispensaries of general hospitals and wards of State Hospitals, almost countless men and women, who, starting as average normal boys and girls, have through faulty mental habits become a burden to themselves and to society. Thus it is with delinquents. We hear so much nowadays about delinquents, especially juvenile delinquents, being feeble-minded. I do not believe this at all. Dr. William Healy, of Boston, psychiatrist to the juvenile court, states that 70 per cent of those coming before him for examination are normal.

Faulty mental habits contracted early in life have a tendency to bring on insanities in individuals who are of bad hereditary taint. Those that are not burdened by insanity and defectiveness in their ancestors may not become actually insane but the faulty habits cause them to be peculiar and they form many of the borderline cases. This is especially true in functional cases, those that are, generally speaking, incurable. Then, too, there is a large group of mental cases that our present knowledge will not let us say definitely whether they are organic or functional, but we know that they are very stubborn to treat and that the majority are incurable (certain types of dementia precox and paranoia). Very frequently in tracing the histories of individuals with these mental troubles it is found that when children they were morbidly shy, very seclusive, and did not want to mix with other children of their own age. Such children, if crossed or corrected, were very apt to fly into an uncontrollable irritability or would withdraw themselves into a moody silence lasting several days. Such behavior is not normal and should be corrected. Such children are apt to develop paranoid personalities, that is, to think that everyone is against them, and finally to progress into a true insanity. Children who do not take part in games with other children are very prone to fall into the habit of day-dreaming, which finally culminates in desires that can't be fulfilled in this

world. They gradually build a phantasy world of their own and soon have to go to a mental hospital. These peculiar traits in children should be noted by parents and teachers and efforts made to correct them early before permanent damage is done. Oftentimes parents don't notice them or if they do they think possibly the children are delicate and humor them in their eccentricities. Such a course is very bad for the child. There will come a time when the parents and family can't put up with the ever increasing whims and fancies or possibly the parents die and the young man or the young woman finds the world will not give them the undue consideration they have enjoyed. A conflict with society occurs and the patient goes to a mental hospital. Many adults take refuge in insanity to escape an existence for which they know themselves unfitted. No one would think that an untrained person should be put in a responsible position without previous training, yet this is what the parent has unconsciously done. If parents would stop and think they would know that the busy world will not take the time and trouble to humor anyone as they have their children. To be a successful citizen a certain coöperation is necessary; if it is denied by the individual, society will place these individuals in hospitals or reformatories where society will be least disturbed by their anti-social acts.

It appears to me that one great factor in the training of our children has been overlooked by our present educational system. Is it not possible that we have been so intent upon material and intellectual progress that we have neglected the most important side of our education. I refer to religious education in the home. The time was a few years back when almost every home had religious instruction and family prayers more or less regularly in the home circle; but since the automobile has cut down distance so materially and since the appeal of the movies has become so urgent our home life has been sadly interfered with.

In our struggle for material advancement and in our pursuit of pleasure, we have gotten away from the custom of self denial and discipline which is the only possible means of developing character. Character cannot be built up by erecting barriers in the shape of laws to correct individual conduct. It is true that there must be laws that will protect the innocent and the well-

meaning citizens against the aggressiveness of the vicious. These laws are vital to any civilization but no matter how many or how varied or how severe the laws regulating individual conduct they will not be enforced by the majority unless children are taught in the early formative years that conforming to these laws brings the greatest total amount of peace and happiness to the individual. The time to do this is with the children up to twelve years of age and the responsibility to teach and correct the child cannot be shifted to the State or to philanthropic or charitable organizations. It is one of the duties of the parents and the place it should be done is in the home.

Just now it is difficult for a young person to have definite ideals because there is no well defined moral code defined by religion. On every hand the child is denied the teachings of abstract moral sentiments because of a confusion of parts of Christian and Pagan philosophy, which are so incompatible. Every one has conflicts that arise from time to time which must be met and conquered. The conflict is not injurious but the failure to meet them face to face and thus build up character is the reason we have so many new functional cases each year.

For the guidance of parents, any State Hospital physician can tell you he has many cases under his care the result of an emotional shock of a sexual nature experienced during the ages from seven to thirteen or fourteen years.

Now do not think that I am an alarmist, that I am a pessimist regarding the outcome of the growing generation, because I do feel that the younger generation will surmount its difficulties as we have surmounted ours; but it does make one stop and think when one realizes that the problems that many of us did not have to meet until the ages of eighteen to twenty-five are now being met and must be conquered ten to fifteen years earlier in life.

Each generation, like the individual child, must meet its problems, conquer them and survive or else in meeting them fail to make the proper adjustment and go down in defeat.

Let us not be too hard upon the restlessness of the growing generation but let us admit that some of their difficulties could be more easily conquered if the present generation had attended to their home duties and responsibilities a little better.

## THE EVOLUTION OF NEPHRITIS: ITS PROGNOSIS AND TREATMENT\*

### Part I

#### RENAL FUNCTION AND THE EVOLUTION OF NEPHRITIS

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Our conception of the nature of nephritis, the elements upon which an opinion as to the final outcome is based, and the principles involved in the treatment of this condition have undergone a marked change during the past ten years. This has been due chiefly to three factors: (1) the interest that has been manifested by the medical profession in hypertension, arteriosclerosis and the changes that occur in the vessels of the arteriocapillary bed as the result of inflammatory, metabolic and degenerative processes; (2) increasing information that has resulted from pathologic study of the tissues of nephritis patients (the result of this study, however, has been somewhat disappointing and in many instances has failed in clarifying our knowledge); (3) knowledge of kidney function by the concentration and secretory tests, dye function and study of the concentration of the end-products of nitrogen metabolism in the blood plasma. The kidney has lent itself particularly well to functional study.

To attempt to review the subject of nephritis in all its phases in an article of this kind would be unprofitable, if not impossible. It is unnecessary, when excellent monographs are available in the several systems of medicine. It is rather the purpose of this series of papers to bring out the high lights of normal and disturbed renal function, the evolution of nephritis from its beginning to its terminal stage, its prognosis and treatment. The writer will approach this subject, not from the viewpoint of the specialist in nephritis, but from that of the practitioner, the nature of whose work is such that he is frequently asked to give advice as to the significance and the management of this condition.

Before proceeding to the discussion of nephritis, it will be profitable to review briefly normal renal function. For our purpose it may be considered under the following headings:

\*From the Medical Division of the Nicollet Clinic, Minneapolis. Part II will appear in the April number of the journal, and Part III in the May number.

The first function of the kidney to be considered is the filtration, reabsorption and excretion of water. The present view and the one accepted by Aschoff<sup>1</sup> is that the glomerular function is entirely one of filtration and that of the convoluted tubule is one of reabsorption. Aschoff's views have undergone a complete change over those held by him ten years ago, prior to the delivery of his recent Harvey Lecture. At that time he considered that the first and intermediate portions of the convoluted tubule had a secretory function, while the function of the distal and transitory portion was absorption. The work of Aschoff and his associates, Suzuki and Mitamura, with vital staining of the glomerulotubular system of the kidney with lithium carmine, is responsible for this conclusion. For the details of their interesting and convincing experiments the reader is referred to Dr. Aschoff's lecture.

Aschoff's views on renal physiology are in accord with those of Cushney, Starling and Varney, and Wearn and Richards as reviewed by Hench in his recent publication.<sup>2</sup> Of these authors only Starling and Varney assign any excretory function to the tubule for a portion of the dye and urea. This includes the fundamental work of Wearn and Richards in catheterization of individual glomeruli of the frog and comparison with the bladder urine.

As to the function of the loops of Henle, Aschoff states that adequate experimental proof is still lacking. He advances the hypothesis that this portion of the tubular system acts as a syphon and pressure regulator system. This explanation suggests itself to him because the glomeruli lie at different levels in the cortex, the convoluted tubules have a constant length, and the loops vary in length according to the level of the glomerulus in the cortex. My understanding of this theory is that if the glomerulus is near the kidney surface, the loop is short; if it lies deep, the loop is long, so that the lengths of the individual tubular systems between glomeruli and intercalary tubules are approximated and the hydrostatic pressure is thereby equalized, or nearly equalized. This explanation may not be as uncomplicated as above stated. The work of other investigators has brought out the fact that while some glomerulotubular systems are functioning, others are resting. This suggests that there are other factors involved.

That the filtration and absorption function of the kidney is an important one is apparent when we consider that for every sixty-two liters of filtrate passing through the glomeruli, sixty-one are reabsorbed and one liter passes out as the solvent for the non-threshold substances in the urine. The breakdown of this function determines to some extent whether or not edema accompanies nephritis.

Mix<sup>3</sup> states this very succinctly by saying that the clogging of the glomeruli results in water retention and edema and that if the filter works and resorption fails, we have polyuria. Here, again, the explanation must be more far-reaching to encompass all the factors involved; namely, salt distribution in the tissues, permeability of the tissue capillary threshold, osmotic tension, tissue cell metabolism and colloid chemical reactions.

A second kidney function is that of salt excretion or removal of salt from the blood plasma. The kidney is very economical in the exercise of this function and the salt concentration in the urine is much below that found in the blood plasma. A large portion of the salt is therefore reabsorbed. The salt concentration in the blood plasma is rather labile and salt passes from plasma to tissue and from tissue to plasma rather easily. The plasma may be said to be a transfer station between kidney and tissue and probably for this reason estimation of plasma chlorides in nephritis and edema has been rather disappointing and inconclusive.

A third function is the excretion of the end-products of protein catabolism. These substances are urea, uric acid, creatin, creatinine, amino acids and the "rest nitrogen" or unidentified nitrogen fraction. All are waste products and have no further use in the human economy, and therefore are not reabsorbed, but are excreted in a higher concentration than they are found in the blood plasma.

A fourth function is the recovery of the threshold substances or substances useful to the human economy. The important threshold substances are dextrose, chloride, sodium and potassium. Dextrose possesses a high threshold, while that of the last is relatively low.

A fifth function is the elimination of non-threshold substances, or those of no further use to the body. The important non-threshold substances are urea and other nitrogenous end-

products already mentioned, sulphate and phosphate. It will be seen from this, that the convoluted tubule is endowed with a highly selective function in retrieving from the filtrate what is to be salvaged and allowing useless substances to go by.

It is apparent also that none of the urinary solids is formed or synthesized by the kidney and that it is an excretory organ almost entirely. Hippuric acid and possibly a small part of the urinary ammonia<sup>4</sup> are the only substances formed in the kidney and for these substances alone it may be designated as a secretory organ.

The sixth and last function of the kidney to be considered is the assistance it renders in the maintenance of acid-base equilibrium by excretion of phosphate. This is a very delicately adjusted body function and life depends upon it. The reaction of the blood plasma is slightly more alkaline than distilled water and its indicator range is between methyl orange and phenolphthalein. Measured in terms of hydrogen-ion concentration, the normal  $P_H$  value of the blood is  $P_H$  7.3 -  $P_H$  7.5. If it drops below  $P_H$  7.0, coma develops, and if it rises above  $P_H$  7.8, alkalosis supervenes, accompanied by symptoms of tetany. Any figure falling outside of these extremes is usually incompatible with human life.

It is a temptation to enter into a general discussion of this subject from the clinical and physiological aspects, but that would extend beyond the scope of this article. I shall confine myself as much as possible to the part in which the kidney is involved.

The kidney assists in keeping the blood alkaline by excretion of phosphate. Since the ingestion of meat, cereals and salt increases the acid, and fruit and vegetables the alkaline tide of the blood, the kidney is constantly endeavoring to meet this change in acid-base equilibrium produced by variation in diet. It accomplishes this by increased excretion of phosphate when the first-mentioned foods overbalance the diet. The  $O_2$  and  $CO_2$  respiratory exchange is the other chief factor involved in maintaining this equilibrium. Increased respiratory exchange decreases acidosis. In the terminal stages of nephritis, when the kidney is no longer able to eliminate phosphate, acidosis results and a persistent alkaline urine in chronic nephritis is a finding of grave import. If its significance is passed over, a sense of false security may further be enter-

tained by the disappearance of the albumin, unless one takes great care to render the specimen acid. The alkaline reaction produces a disappearance of the casts, also.

#### DISTURBED KIDNEY FUNCTION

Disturbed kidney function produces in the nephritic patient abnormalities in the excretion of water, salt and nitrogen. We may have a retention of any one or all of these substances, which is the usual finding, but we may also have a hyperexcretion of water, as in chronic nephritis without edema. Abnormalities of excretion of water and salt are closely interdependent. Dr. O'Hare,<sup>5</sup> in a series of experiments in 1916 showed that water and salt excretions obeyed similar laws and in twenty-six out of thirty-two cases of nephritis were parallel. The nitrogen curve did not follow so closely, however. The result of his experiments showed that the excretion of salt is more quickly and seriously affected than that of water and the ability to excrete nitrogen is retained for a much longer period. A rather striking feature about nephritis is that the ability of the kidney to excrete nitrogen may be entirely disassociated from its water and salt function. This condition obtains in subacute nephritis with edema. (Here the nitrogen function is normal and the water and salt functions are greatly impaired.) In the most severe cases, however, there is usually a fixation of all three elements.

The occurrence of disturbed water, salt and nitrogen excretion in the different types of nephritis may be represented by the following table. This table is based on the nomenclature used by Dr. Christian in his Clinical Classification of Nephritis.<sup>6</sup>

#### DISTURBED KIDNEY FUNCTION IN NEPHRITIS

1. Water excretion
  1. Retention { Acute nephritis with edema  
Subacute nephritis with edema  
Mercurial poisoning without edema }
  2. Hyperexcretion (Chronic nephritis with polyuria.)
2. Salt excretion
  1. Retention { Acute  
Subacute  
Chronic nephritis } with edema
3. Nitrogen excretion
  1. Retention { Acute nephritis  
Chronic nephritis } with renal insufficiency



In order to understand the progress of nephritis one must have a conception of what constitutes the condition known as renal insufficiency. This condition pertains to the breakdown of the ability of the kidney to eliminate nitrogen with or without impairment of the water and salt elimination. The nephritic patient with renal insufficiency presents the following objective findings, and it is on these findings that the present status, outlook and treatment of the patient must be largely determined.

#### FEATURES OF RENAL INSUFFICIENCY

1. Elevation of blood pressure (except in rare cases of nephritis, massive destruction of kidney tissue due to infection and at times renal insufficiency due to back pressure).
2. Diminished phenolsulphophthalein excretion.
3. Progressive anemia (due to diminished blood formation).
4. Retention in blood plasma of the nitrogenous end products.

By a careful and repeated monthly check of the first three findings it is possible for the practitioner to obtain information of great value and to predict with reasonable accuracy the development of renal insufficiency. This can be done without recourse to blood chemistry, if facilities for this additional test are not available. A steadily rising blood pressure, a dropping phthalein output and a progressive anemia, all indicate that the nephritis is pursuing an unfavorable trend and is most probably heading toward renal insufficiency. To avoid erroneous conclusions, the exceptions stated under blood pressure elevation must be kept in mind.

The value of anemia as an index of renal insufficiency is somewhat mitigated by its rather tardy appearance. Brown and Roth<sup>7</sup> have shown that it does not appear until at least from four to six weeks after the onset of renal insufficiency and may not be demonstrable until a longer interval has elapsed.

It must be admitted that the phthalein test, combined with the blood urea nitrogen or non-protein nitrogen, is the most reliable method of recognizing early renal insufficiency. My experience with these two tests, during my association with Dr. James P. O'Hare in the Renal Clinic of the Peter Bent Brigham Hospital, has convinced me that the result of one of these two tests may

predict with reasonable accuracy the result of the other. This relationship can be approximately stated according to the following inverse table:

Comparison of phthalein and blood urea nitrogen values, arranged according to 10's:

	% Mgms. per 100 c.c.		
Phthalein	40's*	10's	Blood urea nitrogen
"	30	20	
"	20	30	
"	10	40	
"	—10	50+	

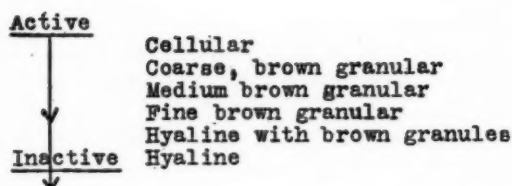
From the above it may be seen that when the phthalein is in the 40's the blood urea nitrogen is in the 10's, and when the phthalein drops to the 30's the blood urea nitrogen rises to the 20's and continues in this inverse ratio. In numerous cases that developed renal insufficiency under our observation, we saw the phthalein decrease and the blood urea nitrogen increase according to this ratio. At times, when a patient first comes under observation, the blood urea nitrogen may be high and out of proportion to the phthalein, but further inquiry will usually show that the patient has not been well managed and that excess protein has been allowed in his diet.

In stressing the accuracy and advantages of the combined phthalein and blood urea nitrogen tests, it is not my purpose to detract from the importance of the phthalein test, but rather to emphasize its utility when combined with blood pressure determination and blood counts done together at regularly repeated intervals.

Before entering upon the hazardous undertaking of tracing through the evolution of nephritis, it is necessary to comment briefly upon cast formation and the significance of the various types of casts found in urinary sediments. According to Cushny<sup>8</sup> the formation of casts may be summarized as follows:

1. Leakage of hyaline material through glomeruli.
2. Above is coagulated by increasing acidity of filtrate, producing the matrix of the cast.
3. Type of cast determined by activity of tubular degeneration.
4. Activity of renal lesion "graded down" according to type of casts as follows:

\*40's include 40-49, and so on down through the table.



Fatty and waxy casts do not fit in the above scheme, but both occur in extensive and moderately active renal degeneration. The fatty casts, particularly, occur in nephrosis and subacute nephritis with edema. The broad, waxy casts, according to Addis,<sup>9</sup> are the forerunners of uremia. I have, however, seen this type of cast in fairly large numbers in a case of subacute nephritis with edema with a fairly normal renal function. From what has been said concerning activity of renal degeneration and casts when the sediment is composed of all types of casts, we infer that the renal degeneration is active in some parts of the kidney and inactive in others.

In tracing through the evolution or progression of nephritis, I shall touch upon only some of the outstanding features.

Acute nephritis, when it comes under the observation of the clinician, can usually be recognized as belonging to one of three types: (1)

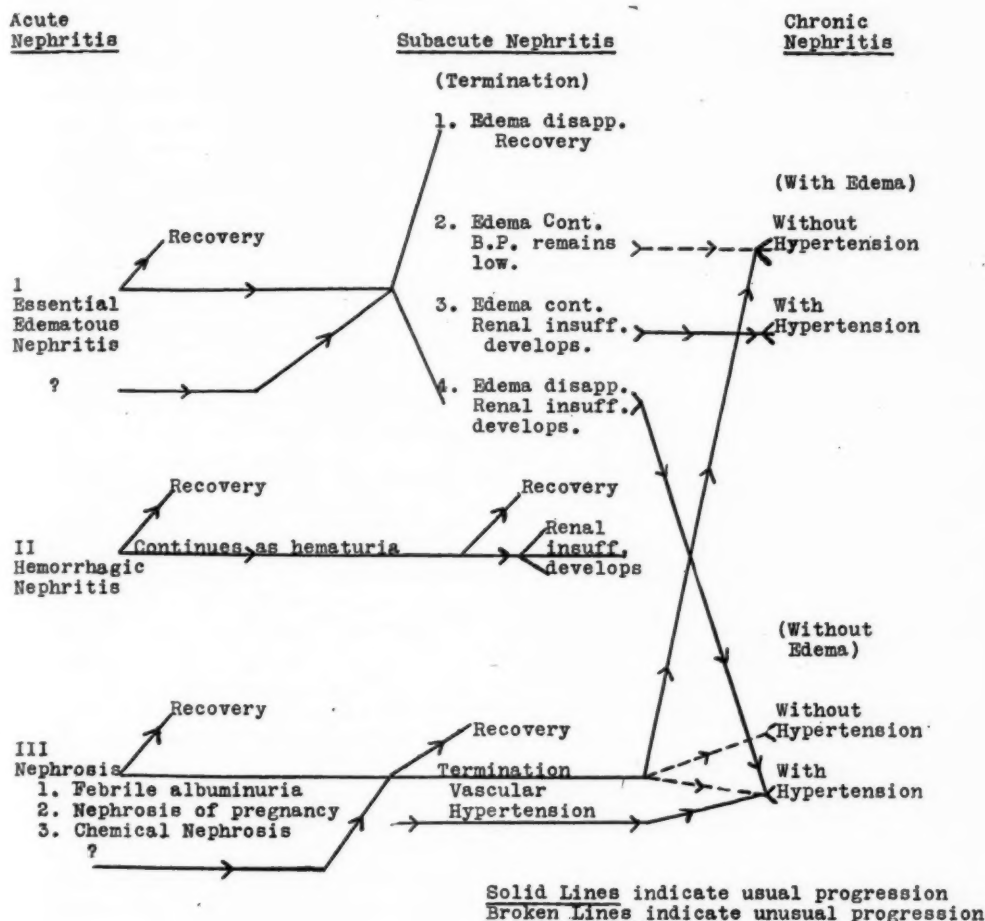
essential edematous nephritis; (2) hemorrhagic nephritis; or (3) nephrosis. The outstanding clinical features of these three types are enumerated in the table below.

It is unnecessary to make any extended comments on this table, except to emphasize that in the essential edematous nephritis the sediment shows a characteristic picture, in that the *cellular elements predominate*, while casts are found in moderate numbers and are of the acute degenerative type. In hemorrhagic nephritis the *red cells predominate in the sediment* and the relatively few casts are usually brown granular and red blood cell in character. At first glance it may appear as if one were dealing with a pure hematuria and, as O'Hare and Walker<sup>10</sup> have pointed out, casts may be found only after careful search and then only around the edges of the cover glass. In nephrosis the sediment is likewise characteristic in that the *casts predominate* and are of one type according to the acuity of the renal degeneration (*e.g.*, there may be nearly all coarse brown granular casts) and a *striking absence of cellular elements*. In addition to the findings in the sediment, a normal or subnormal blood pressure early in nephritis indicates the possibility of its being a nephrosis.

TABLE I  
OUTSTANDING CLINICAL FEATURES OF THE ACUTE NEPHRITIDES

	<i>Essential Edematous Nephritis</i>	<i>Hemorrhagic Nephritis</i>	<i>Nephrosis</i>
1. Frequency	2 to	1	Rare
2. Etiology	Strep. inf. 2/3 other inf. (Typhoid, pneumonia). Malaria, syphilis 1/3.	Same	Pneum., Diph., syphilis and other non-strep. inf. Tuberculosis
3. Onset	Grad. to fulminating	Grad. with smoky urine	Grad. to sudden
4. Blood Pressure	Moderately elevated	Same	Normal or subnormal
5. Edema	Marked	Less	Moderate and fixed
6. Urine Quantity	Oliguria	Less	Oliguria
7. Urine, Sp. Gr.	High	Variable, less and may be low	High
8. Albumin	+ to +++	+ to ++	+++ to ++++
9. Casts	Moderate number of the acute degenerative types	Few casts, usually brown, granular and R. B. C. casts	Numerous acute degenerative types with tendency to one type
10. Cellular Elements	Many W. B. C., R. B. C. and small round cells	Red blood cells predominate	Few cellular elements an outstanding feature.

TABLE II



It follows that careful study of the sediment yields much valuable diagnostic information and it also enables the clinician to gauge the activity of the degenerative process in the kidney. This study of the sediment should be repeated, and, as Dr. O'Hare has frequently stressed, should be carried out by the clinician himself. A laboratory report, no matter how well prepared it may be, cannot compare with the physician's visualization of the findings in the microscopic field, aided by proper interpretation.

To trace through the progression of nephritis I find it expedient to make use of a diagram which at first sight appears rather involved, but which suits the purpose better than any that I can devise. This represents Dr. O'Hare's ideas

on the clinical classification of nephritis, somewhat modified by the author.\*

With the aid of this diagram it is possible to identify the majority of cases of nephritis as belonging to one of three types and to follow the progress of the patient and the route that he travels. This cannot be predicted at the beginning and the whole picture may require several years for completion.

This is most fully appreciated when one has an opportunity to carefully study a nephritic patient in a large out-patient clinic where every type is seen and followed over an extended period of time. Not infrequently a patient who

\*This diagram is published with Dr. O'Hare's permission, and it should be mentioned that in a personal communication he stated that it could be somewhat simplified.

appears to be following a definite path to an expected termination changes his course of progress and travels to an unlooked for termination.

Referring to the diagram, first we shall direct our attention to essential edematous nephritis. It may and often does terminate with recovery in the acute stage, with subsidence of the edema, disappearance of the albuminuria and cessation of the renal degeneration or clearing of the sediment and return of normal function. It is unwise to reach this conclusion until after many months have elapsed and the patient has gone through at least one acute upper respiratory infection without a flare up. If recovery does not take place in the acute stage the nephritis progresses to the subacute stage. It is not always possible to draw a definite line of demarcation between these two stages. However, when there is persistence or return of the edema and renal degeneration continues after renal function has returned to normal several weeks after the acute onset, the nephritis may be said to be in the subacute stage. There is also a group of cases having an ill-defined insidious onset that first come under observation with the features of subacute nephritis without passing through the acute stage. When nephritis is in the subacute stage it remains so as long as renal degeneration remains active and renal function remains normal, or nearly normal. The time element does not determine when it becomes chronic. It is possible for it to remain in this stage for several years and still be subacute nephritis. Subacute nephritic has four modes of termination: (1) Recovery may take place with disappearance of the edema and albuminuria and cessation of renal degeneration. This fortunate turn is rather unusual. (2) The edema continues, the blood pressure remains low and renal function remains normal with cessation of the active renal degeneration (hyaline casts take the place of the degenerative casts) and we have chronic nephritis with edema, without hypertension. The type of cast found is the distinguishing feature. This also is an unusual method of termination. (3) Edema continues, renal degeneration subsides, with elevation of blood pressure and development of renal insufficiency. This is known as chronic glomerular nephritis in many clinics and is the usual method of progression. (4) The edema disappears, renal degeneration ceases and renal insufficiency develops. Because of the

disappearance of the edema, the patient is much encouraged and the marked clearing up of the sediment and diminished albuminuria may cause the medical attendant to feel optimistic, while in the kidney the process of contraction with terminal sclerosis is beginning to slowly shut down kidney function. To see the first few patients pass through this stage of their nephritis leaves a lasting impression. It emphasizes the important part that renal insufficiency plays in determining the outcome. It is my intention to discuss the prognosis of nephritis later, but I cannot desist from advising extreme caution in making an optimistic prognosis in such instances, until one sees what happens to the blood pressure and renal function.

Hemorrhagic nephritis has certain features already pointed out that warrant its recognition as a clinical entity. Recovery may take place in the acute stage with the complete disappearance of albumin, casts and red blood cells from the urine. One must, however, exercise great caution in pronouncing a cure, and repeated examinations of the urine over a period of several months must show entire absence of red blood cells. Cure in the acute stage is a slower process than in the essential edematous nephritis. If recovery does not occur in the acute stage, hemorrhagic nephritis may continue as a hematuria for a period of one to two, or even three to four, years. No doubt, many of the cases diagnosed as "essential hematuria" will on more critical study be found to be hemorrhagic nephritis. Recovery may take place in the subacute stage after a long period of hematuria, or an acute infection or other insult may precipitate the onset of renal insufficiency, which increases until death of the patient occurs.

Acute clinical nephrosis, while possible, is very rare. It is more likely to be insidious in onset and be recognized first in the subacute stage. In my personal experience, the only two cases seen of the onset of this type came on several weeks after an attack of pneumonia. When the subacute stage is reached, recovery may occur (in my own limited experience I have not seen it) or the condition may terminate as a chronic nephritis with edema, without hypertension. The urine at this stage shows abundant albumin and hyaline casts with very little else in the sediment. A more unusual termination is a disappearance of the edema with the above picture; then the



result is a chronic nephritis without edema and without hypertension. The third and rather unusual termination is disappearance of edema, cessation of renal degeneration, with development of hypertension and renal insufficiency; namely, chronic nephritis with hypertension, without edema.

Febrile albuminuria, nephrosis of pregnancy and chemical nephrosis are special types of acute nephritis and need not be discussed in this paper. Likewise, essential hypertension with slowly progressive renal insufficiency, terminating as a chronic nephritis, will not be discussed. It is a chapter in nephritis by itself. The arteriosclerotic kidney found in decrescent arteriosclerosis occupies a similar position.

When nephritis has reached the chronic stage, if death does not occur because of renal insufficiency and cardiovascular and cerebral complications, the patient may outlive his nephritis and death may occur as a result of intercurrent infection (pneumococcic and streptococcic infections, particularly) and intercurrent disease.

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Note: In the preparation of this and the ensuing manuscripts on the Prognosis and Treatment of Nephritis, I have drawn on my experience with clinical material in the medical wards and Out-Door Renal Clinic of the Peter Bent Brigham Hospital, Boston. Many of the viewpoints concerning nephritis which I have endeavored to express are those that were held there during my period of connection with that institution (February, 1924, to July, 1925). However, these viewpoints have been somewhat modified by my own impressions and interpretations. For these departures I wish to assume personal responsibility.

H. O. A.

## ALCOHOL AND ITS EFFECTS ON THE NERVOUS SYSTEM\*

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Sir James Crichton-Brown at the Lady Priestly Memorial Lecture in London said, "There is no subject outside religion about which there has been more heated and acrimonious controversy than alcohol. On the one hand it has been extolled as the elixir of life, and on the other denounced as a deadly poison." It will not be within the scope of this paper to weigh the evidence for and against alcohol as a beverage or a food, but in view of the facts about to be presented it will be seen that the subject is worthy of the consideration of every medical practitioner. These facts are as follows:

During the first five years immediately preceding the beginning of prohibition in this country, there were at the Ancker Hospital in St. Paul just 21 deaths from acute and chronic alcoholism. During the first five years following the beginning of prohibition enforcement there were 53 deaths, or about two and one-half times as many. Over 60 per cent of these occurred during the first two years of that period. During the five years preceding prohibition there were no deaths from wood alcohol poisoning. During a similar period following prohibition there were 14 deaths from this cause. In Chicago the alcoholic mortality in 1923 had reached pre-war figures.<sup>1</sup> Another reason why the study of alcohol demands our interest is that the type of poisoning produced by present day liquors is somewhat different from that seen in pre-prohibition days. This new type is popularly known as "moonshine poisoning" and has been responsible for some very curious and interesting clinical phenomena. These will be dealt with later.

There has been some difference of opinion concerning the pharmacology of moonshine whisky. Professor Brown,<sup>2</sup> who experimented with bootleg liquor prepared in his laboratory at the University of Minnesota, found that the toxic effects on frogs were practically the same as those of a corresponding alcoholic strength of government alcohol. The Bureau of Chemistry also tested

\*Read before the Southern Minnesota Medical Association, Mankato, Minnesota, Oct. 18, 1926.

600 samples of unadulterated bootleg liquor and were unable to find anything to account for its toxicity. From his toxicological work on individuals who had died after drinking moonshine whisky, Professor Brown concluded that death was due to an excessive amount of alcohol rather than to any impurities that may have been present. Gerty,<sup>1</sup> on the other hand, believes that moonshine poisoning is alcoholism of a modified or aberrant type and that various aldehydes are responsible for the increased toxicity. He states that this type of poisoning differs from ordinary alcoholic poisoning in that it takes effect more rapidly and the patient is brought to the hospital sooner because of the gravity of his symptoms. In other words, a smaller amount of the prevalent beverage is required to incapacitate. He also states that the effect is more profound and more often fatal, mental deterioration is commoner after a few speers, and that pneumonia and alcoholic cirrhosis do not appear so frequently. Our experience at the Ancker Hospital bears out his statement with regard to alcoholic cirrhosis. The average number of admission for this condition per year for five years before prohibition was 17.6. Since the beginning of prohibition it has fallen to 1.8.

Undoubtedly methyl alcohol (wood alcohol) is purposely or unwittingly present in many beverages and has been responsible for many cases of alcohol poisoning. Since it is destroyed or even excreted with great difficulty and remains incompletely oxidized as formic acid and probably formaldehyde in the body for a long time after ingestion, it is undoubtedly more toxic than an equal quantity of ethyl alcohol, which is a food and can be oxidized completely. Since the latter may be "denatured" by the addition of highly toxic substances and this commercially available form re-distilled to make bootleg liquor, one might expect to find some of these poisons in it. However, according to Hunt,<sup>3</sup> the most common ingredient present in moonshine whisky which is not found in good whisky is acetaldehyde. The toxicity of this substance is comparatively low, and in the samples analyzed one would have to consume approximately his own body weight of moonshine to get a lethal dose of acetaldehyde. In this event, he obviously would die of alcohol poisoning long before a killing dose of acetaldehyde could be taken.

Hunt agrees with Brown in the belief that the

toxic effects of various beverages on laboratory animals can be explained by the amount and concentration of alcohol taken. The depth of intoxication and the danger to life depend upon the concentration of alcohol in the blood, and this in turn depends upon the amount and concentration of alcohol taken. Since the margin between profound intoxication and death is a narrow one, it is easy to see how a large amount of highly concentrated alcohol, such as is found in our present day moonshine, taken in a short period of time can produce death.

However, that alcoholic distillates obtained from a fermented mixture of corn meal and sugar are more toxic than an equal amount of ethyl alcohol has been well shown by MacNider<sup>2</sup> in his work on dogs. This investigator has shown that ethyl alcohol in normal animals is but slightly nephrotoxic, while an alcoholic distillate obtained from a fermented mixture of corn meal and sugar develops evidences of a nephrotoxic action which is manifested by changes in the urine. He believes that this toxicity is not due primarily to the presence of ethyl alcohol, but to some other undetermined substance. It would seem from the peculiar clinical effects of some of these distillates on humans that this view is correct.

That the present day moonshine is a quick killer is seen from a study of various hospital statistics. This shows that there has been a marked decrease in the number of cases of portal cirrhosis and delirium tremens with a much smaller decrease in the number of cases of acute and chronic alcoholism. At the Ancker Hospital the average number of cases of portal cirrhosis per year has decreased 91 per cent since prohibition, and of delirium tremens 65 per cent. However, the number of yearly admissions for acute and chronic alcoholism has decreased only twenty-two per cent. Gerty's statistics at the Cook County Hospital in Chicago show a similar result. The inference that can be made from this is that the alcoholic patient of today dies as a result of his habit before the end-results of chronic intoxication can develop.

Nugum and Mañer,<sup>4</sup> from a study of the blood chemistry in chronic alcoholism, believe that the early chemical changes in the blood are the stepping stones to the gross changes in the brain and other tissues. In addition to edema of the meninges, the brain tissues of persons dying of

delirium tremens have been found to have a markedly increased hydration capacity, that is, there has been cerebral edema. This is thought to be due to an acidosis and the belief is substantiated by the fact that the same increase in hydration capacity is found in persons dying of uremia—a condition in which acidosis is known to exist. Post-mortem examinations of rabbits in which a condition of chronic alcoholism had been experimentally produced showed that while cerebral edema was not always found, the animals' brains had an increased hydration capacity, sometimes to a surprising degree. At the same time a definite acidosis was shown to exist in rabbits in which chronic alcoholism had developed.

It is the writer's opinion that in addition to this, the direct action of alcohol on the cerebral cortex is responsible for many of the mental symptoms appearing in acute and chronic alcoholism. It is a known fact that alcohol can be recovered from the cerebro-spinal fluid in cases of acute intoxication. Since the higher psychic functions are dependent upon the integrity of the cerebral cortex, it is very probable that many of the psychic manifestations of acute and chronic alcoholism are due to the inhibition of these structures through direct contact with the drug. This view also serves to explain the degenerative cell changes found in the cerebral cortex.

The time allotted for this study does not permit of an exhaustive discussion of the psychopathology of alcoholism. However, it is the writer's belief that the uncontrollable desire to drink is a psychological state upon which there has been superimposed a physical defect. According to Dixon<sup>6</sup> the drink habit has undoubtedly served its purpose in the past as one of the many forms of individual protection resorted to by nature to save men from diseases associated with the herd instinct. Dr. William Mayo once said that the consumption of billions of gallons of wine had saved the people of France and Italy from extinction, as they could not have lived had they drunk their polluted water. With the growth of hygiene, there has been a fall in the consumption of alcohol. In other words, alcohol originally served man as a protection against the baneful influences of his environment. At first these influences were physical. Today they are psychic. Our present rapid civilization demands that in order to succeed the individual must use every talent that he possesses. When the pressure of reality upon him becomes too great, the

inadequate personality seeks retreat in various ways. One of these is the solace of the brimming cup. Under the influence of alcohol the jagged edges of reality no longer open psychic wounds, the real person is liberated from the restraints and demands of social customs, and his emotions and primitive instincts are allowed to have full sway. The inhibitions which normally govern the herd, sex, and ego instincts are removed, and an artificial relaxation is induced. The burdens, anxieties, cares and worries of everyday life disappear and the irritability of a super-sensitive nervous system is diminished. In a certain number of individuals alcoholism may be the expression of a true psychosis. We have observed a number of cases of melancholia in which the alcoholism was the result rather than the cause of the morbid mental state, and its symptoms completely clouded the picture for some time.

We see, then, from the foregoing statements that alcoholism must not be regarded as a mere form of vicious indulgence, but as a manifestation of a morbid state. Repeated administration results in the production of a physical condition which makes its further use imperative. Sir John O'Connor<sup>7</sup> found at operations upon alcoholics, cirrhosis of the great omentum similar to cirrhosis of the liver, induration of the bowel wall, and pericolicitis. As he so aptly expresses it, "a continuous 'itis' from lips to anus resulting in spasmodic pains with general abdominal discomfort and black excrement, the morning mouth, and a feeling like nothing until resuscitated by the matutinal gin and tonic."

That continued and prolonged abuse of alcohol can result in various forms of insanity has been known ever since the early days of modern psychiatry. However, since the introduction of new and more toxic forms of alcoholic beverages, the old classifications of these insanities are no longer adequate. There is a blurring of the picture through all of the groups and, although the classification is essentially the same as it formerly was, the cases often are atypical and cannot be clearly designated as belonging to any one particular group. Probably the most practical clinical description of the alcoholic insanities is the one given by Bevan Lewis in his text book. This author groups them as follows:

1—Acute alcoholic insanity

- a. Transient mania, occurring during a bout.

b. Acute alcoholic hallucinosis.

2—Chronic alcoholism

a. Amnesic form with or without delusions. Under this group may be included the Korsakow's psychoses.

b. Chronic delusional form. This usually takes the form of a paranoia (alcoholic paranoia) and the picture may also include hallucinations of sight or hearing.

c. Dementia. This may vary from a mild state of mental enfeeblement to complete dementia, followed by death.

Satisfactory as Lewis' classification may appear to be, it will be seen from some of the following case reports that in this era of moonshine and wood alcohol we encounter clinical pictures of such a protean nature that they do not fall into any of the above-named groups. The writer expresses his gratitude to Dr. E. M. Hammes of St. Paul for aid in selecting the illustrative cases.

*Case 1.*—An attorney, aged 52, was brought to us on August 1, 1925, with a history of having indulged in intermittent sprees for the past twenty-five years. Two years prior to his admission to the hospital, after a prolonged drinking bout, he had an acute mental upset lasting from two to three weeks. The details of this were not available. The present attack dates back to July 10, 1925 (about three weeks before we saw him) when he became intoxicated. The amount and kind of liquor consumed was not known but the patient's condition soon became such as to demand medical attention. He developed a marked confusion, was noisy and restless, and refused all food. Upon his admission, his condition was found to be serious. He was in a muttering delirium with a pronounced occupational coloring. That is, he was constantly talking as if he were trying cases in a court room. Most of the time he was attempting to get out of bed, and it was necessary to put him into restraints. He was completely disoriented in all spheres. The neurological examination was negative for organic signs. His temperature was subnormal, the pulse varied between 80 and 90, and he vomited almost continuously. His urine contained albumin and casts, and the patient appeared to be very toxic. The spinal fluid was under slightly increased pressure but was otherwise negative. A spinal drainage was done with very little benefit to the patient's condition. He refused all nourishment by mouth and had to be tube-fed. Ten days after admission the picture was complicated by the appearance of an infectious enteritis which resisted all forms of treatment for two weeks and then cleared up. On August 30th, twenty days after admission and nearly six weeks after the onset of the mental symptoms, the picture suddenly changed from one of extreme restlessness and confusion to one of marked depression colored by delusions of a persecutory nature. Some of his formulations were almost nihilistic. He said that he was dead, that food did not exist, and that the world was empty.

He had crying spells, tried to get out of bed, and refused all food for a time. This lasted until September 12th, when his mental condition began to clear up, and, on that day, after having spent forty-two days in the hospital and sixty-two days in a totally irrational state, he was well enough to sit up in a wheel-chair for one hour. On this day he was oriented for the first time. From then on he continued to show improvement and on November 17th, after three and a half months in the hospital, was discharged in excellent physical and mental condition.

The interesting features of this case were the unusual mental picture at the onset, changing to an entirely different one six weeks later, the unusually long duration, and the absence of any residual defects after the patient had recovered.

*Case 2.*—This case was a very puzzling one in which the diagnosis was not made until the disease was very well advanced and a history of alcoholism had been obtained from a friend of the patient. The patient, a female, aged 20, was first seen by Dr. Hammes in consultation with Dr. Harry Oerting on June 8, 1926, at which time she was acting in a very peculiar manner and complaining of severe headaches. Many of the symptoms appeared to be hysterical in nature, and others were strongly suggestive of dementia precox. At times she would become excitable, talk in a senseless manner, and upon one occasion barricaded the door of her room without any apparent reason. Two days after admission, before any definite diagnosis could be made, her mother took her home. She was next seen one week later at a different hospital, at which time she was semi-stuporous and complaining of excruciating headache, blurring of vision, vertigo, photophobia, and tenderness over the right side of the scalp. She was vomiting much of the time. Her temperature varied around 99.2 degrees, axillary, the urine was negative except for an occasional trace of sugar, and the cerebro-spinal fluid was normal. The neurological examination was negative except for some labial herpes and hyperesthesia of the extremities. A tentative diagnosis of acute epidemic encephalitis was made, with a toxic psychosis regarded as the second possibility. The patient's condition progressively grew worse, the vomiting increased, and she became irrational and more toxic. She screamed and cried alternately, complaining of terrific headache, trying to climb out of bed, and shouting that she wished she were dead. It was necessary to give her glucose solution intravenously and keep her on continuous proctoclysis because of her alarming condition. Repeated administrations of morphine were required to keep her from disturbing other patients in the hospital and at the same time wearing herself out. On the third day she had visual hallucinations and complained of seeing relatives who had been dead for a long time. On the fifth day she was tube-fed because she refused nourishment and was generally resistive. The pain in her head still was excruciating, but her temperature had returned to normal. On the seventh day her mental condition began to clear up and there were periods during which she was quite rational and cheerful, and she began to improve in all respects. She



insisted upon going home, and on the ninth day became very much upset because she was not permitted to do so. She became sullen and stubborn, refused to take medicine or allow her temperature to be taken. She cried loudly, would not remain in bed, ran to the window and had to be carried back by the nurses. She developed a rather severe headache, and on the next day her mother took her home against medical advice. She was next seen at her home on about July 1st, one week after leaving the hospital, at which time she was complaining of severe headache and vertigo. She was sullen, abusive, stubborn, and uncoöperative. She had slight rigidity of the neck and a strongly suggestive Kernig. It was at this time that it was learned that the patient was in the habit of going out on cocktail parties with friends, and that prior to her original trouble she had been drinking rather heavily.

The interesting feature of this case was its close similarity to encephalitis. To produce the amount of cerebritis that this patient showed, the alcohol she drank certainly must have been a highly toxic product. She has been in the office recently and feels well in all respects.

Other observers have reported cases similar in some respects to the two given above. Barbash<sup>8</sup> reports a patient who, after drinking moonshine whisky, showed an acute delirium during which he chattered aimlessly, was completely disoriented, and practically blind. On the second day he developed signs of meningeal irritation, a positive Kernig and a positive Babinski. On the ninth day he developed a thrombosis of the arteries of his right forearm, necessitating amputation. At the time of Barbash's report the patient had recovered except for a residual impairment of vision and some slight mental confusion. Lemchen<sup>9</sup> reports a period of three months' amnesia following a moonshine debauch. This patient had a picture similar to a Korsakow syndrome including the peripheral neuritis, but differed from a true Korsakow in that she recovered without any dementia and with good insight.

The following two cases illustrate how alcoholism may be the result of a preëxisting melancholia. Both of these patients were sent to us as alcoholics but careful analysis of their histories revealed the fact that definite mental symptoms had existed before the patients began to drink.

*Case 3.*—A male, aged 58, was sent to us for treatment for chronic alcoholism. His history showed that during his early days and until the time he was forty-five years of age he had been a moderately heavy drinker. At forty-five he stopped drinking altogether. Early in 1926 he met with some financial reverses and as a result became depressed. Having a wife and six

children to support and being without adequate means constituted a very trying situation with which he felt unable to cope. He was discouraged, disconsolate, and hopeless. His appetite failed him, he could not sleep and began to lose in weight. He had crying spells and was afraid that he was going to die. In April, 1926, he began to take a small drink of whisky every day to "take the edge off his nerves." After a short time he found that one daily drink did not suffice, so he took two. From then on his daily requirement became greater and greater until finally he was drinking about a quart of whisky a day. The result was that his melancholia became worse and in addition to that he developed the tremors and gastro-intestinal manifestations of chronic alcoholism. He was sent to the hospital, where, as soon as the alcohol was eliminated from his system and proper reconstructive treatment instituted, he began to show improvement. His nausea and vomiting stopped, the tremor disappeared, and the patient looked at life from a different view-point. Under careful psychological guidance the melancholia began to lift, the patient became more cheerful and hopeful, regained his self-confidence, and at the present writing is about ready to be discharged from the hospital. He states that he feels better than he has for the past thirty years.

*Case 4.*—A woman, aged 43, was admitted to the hospital October 28, 1924, for alcoholism. Her husband stated that for six months prior to admission the patient had "not been herself." She was subject to moody spells during which she would be depressed and uncommunicative. She took no interest in her family, and neglected her housework. The family were sure that she was drinking and assigned all of her trouble to this. Later it was discovered that upon two occasions she had attempted suicide, once by taking rat poison, and again by trying to drink the gasoline from the storage tank of her automobile. Further inquiry revealed that during the previous year the patient's menstrual periods had become irregular and scanty, and she was having hot flashes. Upon admission she was depressed, emotionally unstable, and resentful. She objected to being in the hospital and, like so many alcoholics, denied ever having taken a drink. She expressed no actual delusions but confided that at times she heard voices calling her. She had severe crying spells for which she could give no reason except that she "felt blue and there was no use in living." Careful inquiry into her domestic affairs failed to reveal any marital difficulties or other cause for emotional conflict. The neurological examination was negative and her urine contained albumin and leukocytes. She had no appetite, complained of nausea, and her bowels were constipated. The diagnosis at first rested between that of involuntional melancholia and chronic alcoholism. However, after a few weeks in the hospital when we had become better acquainted with the patient, she gave a clear history of a definite melancholia, preceding the alcoholism by a period of several weeks. As she stated, "I felt so miserable and was so blue and discouraged that I had to do something." While in the hospital she made very satisfactory progress. After a stay of approximately three months she was discharged

as cured and since then has remained perfectly well in all respects.

Peripheral neuritis always has been a well-known complication of chronic alcoholism. However, with the increase in the consumption of moonshine and wood alcohol, there has been a change in the type of alcoholic neuritis that we are called upon to see. Formerly the outstanding clinical features of this condition were motor weakness, loss of tendon reflexes, muscular atrophies, and trophic disturbances in the form of ulcers. Recently the condition has taken the form of a marked hyperesthesia with comparatively little reflex changes or motor involvement, and no objective sensory findings. Undoubtedly the hyperesthesia of the extremities in Case 2 was due to this new form of alcoholic neuritis. In most of our cases the hyperesthesia has been the outstanding feature, and at times has been so marked as to cause the patient to scream with pain even from the pressure of the bed clothes on the affected extremities.

*Case 5.*—A male, aged 40, was admitted to the neurological service at Ancker Hospital September 10, 1924, with a diagnosis of wood alcohol poisoning and optic neuritis. He always had been a moderately heavy drinker and for the two years prior to his admission had been in the habit of drinking a small quantity of moonshine every day. He stated that for seven weeks prior to admission he had been drinking about a quart a day. He gave as his excuse the fact that he was suffering from "neuritis of the legs" which was extremely painful. The pains would begin in the toes and extend up both legs as far as the knees. They were in the nature of a drawing, burning sensation which "made the legs feel cold all over." The day before admission he drank about one pint of a new kind of moonshine and was immediately seized with severe sharp pains in the epigastrium. It was for this that he sought medical relief. At this time he also said that for the past two months his vision had been blurred. The neurological examination at first was negative throughout. All of the reflexes of the lower extremities were present and equal and motor power was unimpaired. Aside from a marked hyperesthesia of the lower extremities, careful sensory examination failed to reveal any objective changes. After his admission to the hospital the patient continued to complain of excruciating pain in his legs. This was not relieved by the usual analgesics and heat seemed to have absolutely no effect on it. Ten days after admission he developed trophic ulcers on both feet. These became infected and it was necessary to incise an abscess on one heel. The pain continued and the patient became very difficult to handle. He was sullen, hypersensitive, abusive to the nurses, and very critical. He refused to cooperate, and insisted upon getting up and walking about the ward. He complained bitterly about his legs and insisted that he was not getting the

proper kind of treatment. Because of his constant complaining and abusive manner, his name became a byword among the nurses and interns on the service. His eyes continued to bother him and he was sure that he was going blind. He was repeatedly examined by Dr. Binger and Dr. Rothschild, consulting oculists to the hospital, and at no time was either of them able to find any change in the fundi. It became a continuous monotonous story of poor vision and pains in the legs, running from week to week and month to month. In October he left the hospital because he was not satisfied with his treatment, but he returned in three days, saying that the pains in his legs were unbearable. He denied having had anything to drink while away from the hospital, but examination at the time of re-admission showed impaired pain sense in both arms from the elbows down to the fingers, and marked hyperesthesia of both legs from the knees downward. Tendon reflexes as well as muscle strength were normal and remained so throughout. There were healed scars remaining from the old trophic ulcers. The blood Wassermann and the cerebro-spinal fluid were negative. The pain continued and the patient became very troublesome and fretful. He developed a great variety of symptoms, involving almost every part of his body. He was x-rayed from his head to his feet and seen by a large number of consultants, but nothing other than his peripheral neuritis ever was found. There was nothing that seemed to relieve his pain and on May 12, 1925, after about eight months in the hospital, he again left against medical advice. He reappeared two weeks later with the same old complaints and neurological examination again revealed the hyperesthesia of both lower extremities with analgesia in the hands and arms. One week later he left the hospital against medical advice and has not been seen since.

The points of interest in the above case are the duration of the symptoms and the complete absence of motor weakness or reflex changes. The patient's alcoholism undoubtedly was due to a personality defect which manifested itself also by his abnormal reaction to his surroundings while in the hospital.

*Case 6.*—A male, thirty-two years of age, was admitted to the hospital January 19, 1925, acutely intoxicated. He was in the terminal phase of a spree which had begun by virtue of the fact that his wife had presented him with an heir one week before we saw him, and had been continued because the patient was seeing frogs and elephants, and men with butcher knives were chasing him all over the premises. About a week after his admission to the hospital the patient's enemies retreated and the zoological display disappeared. The patient then discovered that his hands and feet were numb. The patellar jerks were sluggish and there was some diminution to pain over the outer surfaces of the legs. Aside from these findings the neurological examination was negative. The numbness continued for about two months and in the meantime the reflexes and objective sensory findings gradually returned to normal. At no time was there any motor involvement.

The cases of death from acute alcohol poisoning and of optic neuritis are too familiar to warrant discussion here. The chief object of this study has been to point out some of the more unusual clinical effects of our modern alcoholic beverages and to show wherein they differ from those of pre-prohibition days. No attempt has been made to either denounce or justify prohibition but the writer has endeavored to present some of the newer aspects of alcohol and its effects on the nervous system as they have appeared during the past six years.

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#### CHEMICAL EXAMINATION OF ETHYLENE FOR ANESTHESIA

In consideration of the recently reported deaths from ethylene anesthesia, the A. M. A. Chemical Laboratory decided to re-examine the brand of ethylene for anesthesia accepted for New and Non-official Remedies, namely that of the Ohio Chemical and Manufacturing Co. As the Kansas City Oxygen Gas Co. had just submitted its product to the Council, this brand was also examined. The brand of ethylene which was used in the fatal cases was not examined and is not one of the brands reported on. The specimens were examined according to the methods of New and Non-official Remedies and in addition submitted to a more delicate test for carbon monoxide. They met the standards and in none was carbon monoxide found to be present. The Laboratory recommends that physicians use only the brands of ethylene which stand accepted for inclusion in New and Non-official Remedies. (*Jour. A. M. A. Jan. 29, 1927, p. 322.*)

#### INTERRELATIONSHIP BETWEEN TUBERCULOSIS AND THE NERVOUS SYSTEM\*

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Two years ago the following case came to my attention at the Parkview Sanatorium:

*Case 1.*—E. M., a clerk, aged 22, was unmarried and a Norwegian by birth. She had influenza in 1918 and was told she had pulmonary tuberculosis in 1920. She had been a patient at Glen Lake Sanatorium for three months that year.

The patient herself had been born out of wedlock. Her mother married another man later and the stepfather was said to have been very cruel to both her and her mother. She was a bright baby and walked and talked at two years. At the age of six, she lost her mother from tuberculosis. The patient was placed in the Owatonna State School at the age of seven but was adopted a few months later. She did not get along well but continued school and reached the third year of high school. Her employment record was unsatisfactory; she changed positions frequently and employers were not satisfied with her work.

The girl was said to have been well behaved when in school. She did not take people into her confidence, was rather reserved, had a rather sullen disposition, and was not as light hearted nor as full of fun as most children.

At the Glen Lake Sanatorium she had acted peculiarly. She herself felt strange in company with other people. She worried a great deal about sexual relations with the son of the mistress of the house where she had been employed two years previously. She expressed a desire to live alone and to dress like a boy. She was despondent, self pitying and rather melodramatic.

On November 10, 1922, she was admitted to the Parkview Sanatorium. On May 3, 1923, the house physician found that the patient was apparently in a stupor. When touched on the head by the physician, she started to talk, saying she was going to heaven. When asked what made her refuse to open her eyes, she explained that God made her do it. She was disoriented, did not recognize her physician, could not tell where she was nor could she give the date. She insisted her name was Agnes instead of Elizabeth. Four days later, she became violent, screamed loudly and resisted all nursing endeavors. When I saw her on May 10, 1923, she smiled and talked freely, seemed alert and was correctly oriented. There still was psychomotor excitation. She recalled some of her unusual beliefs and visions and now realized their absurdity. She seemed convinced in the false belief, however, that she was not sick with tuberculosis. A few days later all signs of

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mental disturbance disappeared. I saw her again in July, when she was entirely normal mentally.

Following is the case of a young woman who had both tuberculosis and mental disease, and whose family history records cases of insanity as well as tuberculosis.

*Case 2.*—Miss F., aged 32, single, first showed signs of tuberculosis seven years ago. In 1919, six years ago, she was committed to a hospital for the insane because of mental disease. After her discharge from there, she came to live with her father in Minneapolis. She was admitted to Glen Lake Sanatorium about a year ago. Her conduct and her talk have been peculiar all the time that she has been under observation. She exhibited impulsivity and a lack of ordinary comprehension of hospital regulations. Flushing of the face, tachycardia and weakness were very evident. She complained of having to stay in bed longer than a neighboring patient and thought her physician most unreasonable. He made her often very angry. Her mental status briefly was one of simple intellectual deterioration. Because of her poor coöperation, treatment could not be successfully carried out after complete rest in bed became unnecessary. Preferring no other type of institutional care, the father took the patient to his home.

The patient's mother had died of heart trouble. Her maternal aunt had died of tuberculosis and her only sister is now confined in an insane asylum.

Only last month a patient was referred to me because signs of psychosis were noted two days prior to consultation.

*Case 3.*—This girl was native born, single and twenty-four years of age. She presented a fairly typical picture of an acute mania. A year ago, she became heart-broken when her fiancé suddenly jilted her for another. It was thought that she brooded over this experience though she never said much about it to the members of her family. She seemed to lack a normal interest and activity after that episode, lost some weight and it seemed her will power was not what it used to be. However, in the spring, some three months later, she picked up and seemed about normal until July, when the mother began to note an unusual restlessness. She could not be quiet, could not settle down and this has continued ever since.

In attempting to ascertain her personal make-up, it was found that the patient had always been considered a sensible girl and quite religious. She was always thoughtful and put herself out readily for others. She could always be depended on. She was not a complainer, not given to nervousness, loved music and played the violin and sang. She was not sulky nor sullen, was well liked, a good mixer and was said to be idealistic. She was very much attached to her father. Her school progress has been good; she finished High School at eighteen and taught school one year. She had never been confined because of serious illness. The menses had always been regular. Her present physical examination reveals no somatic disease. However, her father had been found to be actively tuber-

culous about a week prior to the time I saw her. One aunt has been insane. According to subsequent information, the father had to be committed to the State Hospital because of active psychosis.

The question of interrelationship between tuberculosis and nervous diseases has occupied the attention of clinicians for many years. When one attempts to study in detail the many problems concerned, it soon becomes apparent that some phases are most difficult of exact interpretation.

We ask ourselves, in the first place, "Does tuberculosis cause nerve symptoms and disease?" and, next, "Do nervous diseases increase the incidence and influence the course of tuberculosis?"

#### DOES TUBERCULOSIS CAUSE NERVE SYMPTOMS AND DISEASE?

Physicians who spend much of their time with patients suffering from tuberculosis agree that a "nervous element" is frequently observed. I have found after studying some 200 cases that nervous complaints are comparatively frequent. Von Muralt makes the statement that tuberculous patients are seldom entirely free from nervous symptoms.

I will begin discussing the first question by referring to heredity. Kraepelin, in his eighth Edition of *Psychiatrie*, quotes Tredgold, who found tuberculosis in the parents of 34 per cent of his mental cases; Shuttleworth recorded 28.3 per cent and Schlesinger 24 per cent. Schott is stated to have found tuberculosis in the parents of 12.7 per cent of 209 feeble-minded women and 11.2 per cent in 604 feeble-minded men. Kraepelin hesitates to draw definite conclusions in view of the fact that no adequate comparison to similar series of mentally normal people can be made. Spratling found that 15 per cent of the fathers and 12 per cent of the mothers of epileptics suffered from tuberculosis. Kraft-Ebing, years ago, stated that tuberculosis and neuro-pathic predisposition paralleled in importance in the causation of mental diseases in the offspring. Pottenger quotes Jessen, who is of the opinion that diseases dependent on degeneration of the nervous system are more common in tuberculous families.

The neurological and psychiatric complications of tuberculosis may be classified under two general headings, viz: (1) those that have somatic-neurologic or local signs; (2) those that present no localizing, but general symptoms and syndromes.



### 1. *Somatic-neurologic, or local nerve symptoms.*

Under the first sub-classification, I wish to name the syndromes of abnormal nerve functioning due to local or reflex influences from the diseased lung. The tendency of the tuberculous patient to flushing of the cheek and ear of one side, or both, is well known. The temperature of one side of the face and neck may be higher than the other. Headache with a feeling of heat on the involved side is not uncommon. Apical lung or pleural inflammatory process irritates reflexly the cervical sympathetics, hence these vasomotor symptoms.

Pupillary changes occur with frequency during the course of the disease, probably in at least half of all cases. Often in the early stages the pupils are unusually large. One pupil may be larger than the other, and there is no regularity in persistence of the size of the pupils, for one day it may be the right, and another the left, that is the largest. Vegetative nerve disturbances in the head and neck are frequently observed, more prominent on the side where apical involvement is active. Lagophthalmos is a less common observation.

Secretory phenomena are often noted. Perspiration of one side of the face or neck only, paroxysmal perspiration in the armpits or in all areas of the skin is characteristic in this disease. Reflex symptoms are emphasized by Pottenger, viz.: hoarseness, tickling in the throat, cough, digestive disturbances, circulatory irregularities, flushing of the face and apparent anemia, chest and shoulder pains, spasms and degeneration in the costal muscles.

Disturbances of sensibility and motor functions may be directly associated with the pathological process in the lung or parietal pleura. Pains may be present at the apical region, chest wall, back, shoulder region or in the basal areas in the form of a side-stitch. Pains are frequently of a stabbing character. Deep breathing, sneezing and coughing aggravate these pains. Neuralgic pains in the shoulders, arms, and even finger tips are due reflexly to irritation of nerve filaments by neighboring inflammation. Muscles in these areas may be tender, yet no other objective sensory findings made out. Reflex hyperesthesias in the way of an uncomfortable feeling, local chilly sensation, irritation from the pressure of clothes, occur in dermal zones in-

nervated from the spinal segment which receives the visceral sensory fibres from the lung area involved.

Pottenger has called attention to the fact that new pathological processes in the lung may reflexly induce spasm of the muscles of the neck and chest on the affected side, and, when these hypertonic states persist in chronic form, he noted that atrophy of the particular muscles may follow. Von Muralt finds muscle changes more common than the sensory zones described first by Head. He adds that in interpreting changes in the chest wall, one must not overlook the most important influence of lack of lung elasticity, pleural changes, and the connective tissue overgrowth in the diseased lobes.

Other disturbances of a less localizing, but yet of a peripheral character and due to the toxic action of the tubercle bacillus are: nervous dyspepsia, spastic constipation, tachycardia, frequent pollutions in men, heightened sexual irritability, absent or too frequent menstrual periods in women. Bradycardia may be present if the vagus is affected by an adjacent tuberculous lesion in the bronchial glands. Labile heart action, night sweats, feelings of heat and cold, etc., may come on even if pulse and temperature are normal.

F. Breuer reports pharmacological tests applied to 15 tuberculous patients. On two successive occasions 0.75 to 1.0 mg. adrenalin was injected. Aschner's reflex was tested before and after injection. Blood pressure readings were taken every five minutes. Pulse, respiration, temperature, and dermatographia were noted. On another occasion pilocarpin 7.5 to 10.0 mg. was injected subcutaneously and complete blood studies made at intervals thereafter. His conclusions are merely that advanced tuberculosis produces an upset in the sensitivity of the vegetative nervous system. Kadling believes that productive cirrhotic tuberculosis of the lungs does not disturb the excitability of the vegetative nervous system, whereas in the exudative forms, especially in the advanced stages, the excitability is much decreased. No other conclusions can be drawn, he says. Because it is impossible to tell when and where the tuberculous infection first took place, it is difficult to decide whether individuals with a weaker sympathetic system are more prone to the infection than those with the stronger units.

Pottenger says that symptoms directly due to

toxemia are those of stimulation of the central nervous system. This induces endocrine imbalance and that in turn imbalance in the vegetative nervous system. Specifically, toxic symptoms are: malaise, lack of strength and endurance, loss in weight, headache and generalized aching, nervous irritability, digestive disturbances, increased pulse rate, fever and night sweats. These symptoms we must note are, however, not specific for tuberculosis. Trophic disturbances, as dental caries, falling out of hair, Raynaud's disease, occur rather rarely. Oppenheim and Wolf-Eisner have called attention to the increased peripheral nerve irritability in the tuberculous manifested by the galvanic current.

Among the other localizing nerve diseases attributable to tuberculosis are peripheral neuritis, radiculitis, pachymeningitis, leptomeningitis, myelitis, tuberculoma and abscess of the brain and cord, encephalitis and polyneuritic psychosis. These complications are comparatively uncommon and yet not so difficult to interpret. In the pathogenesis of peripheral neuritis there may exist (a) reflex causes, (b) tuberculous process in tissues adjacent to the nerve (phrenic and vagus most frequently) and (c) primary parenchymatous neuritis due to the direct action of the tuberculous toxin. Lortat-Jacob reports a case of radiculitis of the lumbo-sacral region in a patient who for two years suffered from paroxysms of pain, with redness, tremor and flexion of the leg. Autopsy revealed tuberculous cavities in the sciatic sensory roots. Pachymeningitis and myelitis are induced by lesions in the adjacent spines. Only recently I had a case of paraplegia which proved to be a spinal cord syndrome following the onset of spinal caries. Meningitis, with tubercles in the pia, and inflammation and exudate involving all the meninges is encountered more frequently than the other complications mentioned in this group. Tuberculoma is difficult to distinguish clinically from neoplasm. Brain or cord abscess is not common. Encephalitis is a local complication of other brain tuberculous process. Colella reports five cases of polyneuritic psychosis presenting signs of neuritic and psychic changes. I have never seen a case of this type. They are rare, but it is interesting to know that this type of a complication does occur. Impairment of memory and loss of association of ideas are the expected mental symptoms, not different from Korsakoff's syndrome due to other toxic causes.

Anatomical changes in the brains of patients dying from tuberculosis have been described by Nissl. He has shown meningeal and vascular changes, and pronounced degeneration in the cells of the frontal lobes. Whether these changes signify perhaps only the effect on the central nervous system of a chronic debilitating disease rather than specific action of the tuberculous toxin is a matter not yet entirely freed of speculation.

## 2. General nervous or mental syndromes.

Then we come to the second great group of nervous diseases, those that present only general symptoms, the psychoses, psychoneuroses, defective states and epilepsy. Here we find more difficulty in determining the relation of any effect from tuberculosis.

Psychoneurotic symptoms, such as fatigue, increased sensitivity, irritability, lack of usual self-control, disturbed sleep or insomnia, lack of ordinary capacity for decision, euphoria, heightened suggestibility, anxiety states, I have found to be very frequent. Here, however, one must note the probability that the patient's inborn tendencies may only be exaggerated.

True, some tendencies are brought out that were never noted during the normal pretuberculous state. Psychogenic factors in the production of the minor personality changes have been emphasized by Jelliffe and Evans. A Minneapolis General Hospital patient, who did not want to go home and who, though clinically recovered, did not wish to face a disheartening domestic situation (a home with a faithless spouse), illustrates a possible situational factor. Such and similar cases are frequently observed. We must recall that tuberculous infection upsets seriously the life expectations, economic status, and the family life, and can cause unusual personality reactions. The direct effect of the toxin is that of a reducing agent; it predisposes to unstable character manifestations.

I might here relate the case of a young married man, O. L., who suffered from sacroiliac disease. He was reared on a farm. At the time of adolescence he showed a tendency to stealing. More delinquent behavior followed and commitment to a reformatory for about a year resulted. During the last couple years (I saw him in 1922) he committed several of the most brutal sadistic murders of women ever recorded in the history of the community. That his perverse instincts

were made more acute by the chronic infection seemed then a strong possibility.

Von Muralt quotes Wiehrauch, who tested suggestibility in sanatorium cases. He performed *injectio vacua* and reduced fever in 19 per cent of the cases. When he did the same injection with the positive suggestion that fever would follow, 39 per cent of the cases developed fever. I have not had the opportunity to attempt to confirm this procedure. The conclusion was drawn that suggestibility is merely heightened in the tuberculous. This fact should explain why the morale in a sanatorium is so easily disturbed by one bad factor. Suggestion, it has been shown, may influence favorably and otherwise, fever, cough, pain, nutrition and even expectoration.

I have never seen a patient suffering from epilepsy in whom I could determine tuberculosis as a causative factor. Autopsies in so-called idiopathic epilepsy cases have been reported, showing isolated calcified tubercle formation in the brain. Tuberculosis does not cause congenital mental deficiency.

Concerning mental disease Knopf says: "The heart and the mind are normal. The finest traits of character are the rule rather than the exception." Kraepelin states: "Tuberculosis has a small rôle in causing mental disease in spite of the toxic, mixed infection, long fevers and spiritual traumata, that are present. Irritability, dejection, apprehension, self-interest, sexual hyperesthesia, and increased zeal may be present. Occasionally, a delirium of the 'infection delirium' type with confusion, sensory delusions, grandiose ideas, etc., is noted." Pottenger observed several cases of insanity in which the tuberculosis seemed to be the definite etiological factor. He does not state the types observed.

In a long article, based on 2,093 autopsies in which incidence of tuberculosis in every form of mental disease is investigated, M. Zalla discusses tuberculosis and psychosis. From his researches, the author expresses the opinion that syndromes of hebephrenia, catatonia and paranoia are forms of reaction of the central nervous system in constitutionally predisposed persons to presumably differing etiological factors, among which tuberculous infection occupies a not unimportant place. He also thinks that tuberculosis may be an important etiological factor in involution and simple mania.

Liebermeister aptly questions our conception

of the endogenous factor, the hereditary defect, in the etiology of mental disease. He feels certain that many asthenic-anemic syndromes, infantilisms, and even endocrine disturbances can be ascribed to the infection of tuberculosis. While he shows that no specific mental reaction is due to the infection, yet psychosis is suggested to signify possible biologic healing effort, though many psychotics die of tuberculosis.

Only twenty-five years ago it was customary to refer to tuberculous mania, tuberculous depression, paranoia, etc., as if the mental states were of a separate and distinct class. Case 1 is clearly one of delirium of the infection type. Case 2 is one of chronic mental deterioration coming on in adolescence, merely coincidental to the tuberculous infection, through some of the nervous symptoms are attributable to the toxin. In case 3, association of manic depressive psychosis, with the suggested influence of situational factors, is illustrated. In my experience I have never seen a case of psychosis in a patient infected by tuberculosis that could be attributed directly to the infection, excepting the infection and inanition deliria that occasionally occur.

#### DO NERVOUS DISEASES INCREASE THE INCIDENCE OF AND INFLUENCE THE COURSE OF TUBERCULOSIS?

We can state that mental cases in institutions die frequently of this chronic infection. Though obviously an inadequate approach, we can get an idea of the incidence tuberculosis by noting causes of institutional deaths. R. H. Hutchings quotes statistics of the St. Lawrence State Hospital autopsies. Of 447 males and 381 females, active tuberculosis was found in 12.7 and 16.2 per cent respectively. I. J. Sands reports that out of 962 autopsies performed from 1911 to 1919 in the Manhattan State Hospital, active tuberculosis was found in 13.6 per cent; of these 62 per cent were diagnosed correctly antemortem. Thirty per cent of dementia precox cases are said by him to be due to tuberculosis. Cotton found tuberculosis the cause of death in 75 per cent of this group compared to 16 per cent in general paralysis cases, the next highest group. In the acute types of the former group of mental disease dying within three to five years, he reported tuberculosis in nearly all the cases. Naturally, this seems high and has not been confirmed by others. Hagan, quoted by Keyes, states the percentage of tuberculosis among men-

tal cases is five times that of the well people. Mott states that a skilled pathologist at Claybury Asylum found tuberculosis in 20.9 per cent of 1,982 autopsies. Shaw found that the chief cause of death in epileptics in England was 25.2 per cent tuberculosis. Some 88.3 per cent of epileptics reacted to tuberculin as against 33.3 per cent of non-epileptics. The death rate among the feeble-minded from this disease equals that of the insane and epileptics. Obviously enough, it is very likely that the death rates do not equal the incidence of the infection.

#### MENTAL INFLUENCE ON THE COURSE OF TUBERCULOSIS

The effect of psychic influences upon the course of phthisis has already been referred to. In brief an atmosphere of hopefulness, good cheer and freedom from unnecessary irritation, should be instituted. Psychic excitations increase the flow of secretions from the adrenal and thyroid glands particularly, as was shown by Perrin and Puranovitch, who have investigated extensively the subject of disorders in the organo-vegetative nervous system in pulmonary tuberculosis. Depression in the functions of digestion after psychic trauma is well known.

A knowledge of the personality of the patient should be obtained by the physician during his interviews and of course a congenial rapport should be established between the doctor and patient. Chas. L. Minn says that the mental handling of the patient is fully as important as the physical. The patient's hidden griefs, prejudices, feelings and troubles must be brought out and gone over with him.

In the mental hygiene of the tuberculosis sufferer we must reason that physical and mental vitality are reduced; hence, there is a lowering of the patient's morale. His instincts find freer play and so we are not surprised to find that he is unreasonable in his demands, that his likes and dislikes are often quite groundless, that tendencies to whimsical attitudes of mind occur and that he becomes less co-operative than the healthy individual. Irritability, self-centeredness, childishness, anxiety, ungratefulness frequently characterize his makeup. Specifically, we must encourage the patient to allow only the healthier attitudes of mind, to help him in the maintenance of his own morale, to persuade him that yielding to instinctive impulses, as outlined, may lead to

aggravation, rather than to the cure, of his disease.

Naturally, if treatment in the home is attempted, the physician's psycho-therapeutic activity must be broadened to include the familial contacts. Keeping in mind the unhappy sequelae of unhealthy mental attitudes, feelings, shocks, etc., as proven by actual experiment, one should be easily convinced of the importance of the mental aspects of clinical tuberculosis.

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## THE USE OF LIPIODOL IN THE DIAGNOSIS OF PULMONARY CONDITIONS

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Under the most ideal conditions the diagnosis of obscure pulmonary lesions has been difficult. The *x*-ray has added much to our knowledge, but even the interpretation of stereoscopic plates has not given us definite ideas on all pulmonary pathology.

Jackson<sup>1</sup> was able to show the bronchial tree with such a substance as bismuth subcarbonate, and Lynah and Stewart<sup>2</sup> used a suspension of bismuth in oil. Neither has been used as routine to any great extent because of the difficulty experienced by the patient. In 1921, Secord and Forestier<sup>3</sup> showed their first results with iodized oil in living subjects. Since that time the specialists in this field in Europe, and recently in North America, have been using it as a routine procedure for additional help in diagnosis of obscure chest conditions. Archibald and Ballon<sup>4</sup> at McGill, Grady<sup>5</sup> and Prichard<sup>6</sup> have been the earlier workers on this continent. It is impossible to review all of the work.

Iodized oil, or lipiodol, as it is better known, is a clear, amber yellow fluid. Chemically it is 40 per cent iodine held in poppy oil. It has the specific gravity of 1.350, is neutral, and is insoluble in water and alcohol. The iodine is held so closely that it cannot be detected as free iodine by any chemical tests. The opaque and antiseptic qualities make it very effective for examining various cavities by *x*-ray. The liberation of free iodine when exposed to the air, light, humidity, and high temperature gives it a dark brown color, and when this occurs it should not be used. As it is opaque and non-irritating to the mucous membrane, it can be used without discomfort in mapping various cavities in the body. It has been used to examine special cavities, as subarachnoid and epidermal spaces, spinal cord conditions as compression and tumor masses, and the uterus and fallopian tubes by the gynecologist without danger. Any blind cavities, as fistulae, etc., are easily followed with lipiodol. The greatest use seems to be in chest conditions where the bronchial tree can be studied. It is surprising to note the additional information

gained after comparison even with stereoscopic plates. The lack of improvement in many chest conditions can be understood after comparing the two pictures.

The iodide is liberated slowly in the various cavities mentioned. It is stated by Forestier that as a rule the greater proportion of the iodine is excreted in the urine by the third day. However, it is still present even in normal subjects after one or two months in various amounts. We have found it at the end of 21, 28, and 32 days in a few patients, although others seem to absorb it more readily. The normal subjects seem to absorb the oil sooner than pathological cases, although this has not always been the rule. For this reason it has become our practice to examine all cases before a second injection has been made. This is not done because of any great danger, but there might be a difference in interpretation of the area to be examined if it did not fill properly.

It has been found that the iodine is liberated by the alkaline carbonates of the saliva and intestinal secretions. The gastric secretions have no effect on the oil, and therefore if any appreciable quantity has reached the stomach, it should be recovered by lavage before acute iodism occurs. In one case, in a child, when we feared that this might occur, vomiting was induced. So far we have not had any acute symptoms appear. Fluoroscopic examination will control this danger so easily that it has been routine to glance at the stomach in all cases after injection. The patient should also be warned to expectorate all secretions for a few days, and to refrain from swallowing any oil left in the throat after injection. Idiosyncrasies to iodine are said not to be a contraindication unless they are very pronounced.

## TECHNIC OF INJECTION

There are four methods available for injection of lipiodol. The laryngoscopic and bronchoscopic methods demand a special apparatus, and a person trained in the use of it. It is comparatively easy in the hands of one who is familiar with the necessary technic, but for the internist it is not always possible to have either the instrument or the training. I appreciate, however, that there may be certain cases that are better adapted to these methods, and I think that with children especially this is the technic of choice. In the cases of the two children I have done, it

was very tiresome work to get coöperation, although I realize that I was very fortunate in having patients who were not nervous and who quickly lost their fright of me and the instruments. In these cases it seems that Jackson's laryngoscope is the best apparatus to use.

The third method is the cricothyroid method, and seems to be the least desirable of all, especially in adults. Here the oil is injected into the trachea between the cricoid and thyroid cartilages with a straight or curved needle. Local anesthesia is first necessary. There is a possibility of two dangers in this method. Forestier has suggested the possibility of infection in the surrounding tissues following the withdrawal of the needle from the trachea; and secondly, local subcutaneous emphysema has occurred when the oil was injected into the surrounding tissue. I must admit that I know nothing about this method.

The last, or supraglottic method, seems to be the best suited to the internist. In this technic, a local anesthetic of 10 per cent cocaine is used. In some very nervous individuals a hypodermic of one sixth grain of morphine and a hundredth of atropine before beginning the anesthesia will give a better result. In some cases, especially with those who have had treatments of the larynx, an anesthetic may not be necessary. Swab the throat, base of tongue, soft palate, and pharynx two or three times with the cocaine solution. After a few minutes, spray the lower portion of the pharynx, using a spray with a curved nozzle in order to reach the glottis and larynx if possible. After a few minutes, repeat the procedure, telling the patient to hold the tongue forward with a piece of gauze, in order to keep the tongue from slipping back into the throat. Instruct the patient early in the technic to be used, and allow him to become familiar with the various steps. It is surprising to see how well the larynx can be anesthetized in this way. Continue until the patient states that he feels a lump in his throat. Much emphasis must be laid on anesthetizing the soft palate and the back of the pharynx as well as the larynx, since it is necessary to remove both the gag and the cough reflexes. After five or ten minutes, with the tongue held in place, the mirror and curved cannula can be inserted into the back of the throat, and the oil watched as it enters the larynx.

The transglottic method is a modification of the supraglottic technic. Here the cannula is inserted through the glottis into the trachea. This requires more extensive anesthesia, giving 1 to 3 c.c. of warm cocaine directly into the larynx with a catheter or curved cannula.

As a rule, 20 c.c. of the warmed oil is injected, but 40 to 50 c.c. may be necessary to fill the area to be studied, especially if large cavities are present. Apparently there is little danger in this amount, but it is apt to obscure the field with superimposed shadows if only a small area is to be examined.

During the injection with oil the patient should be directed to breathe naturally. If he desires to cough, usually a deep inhalation will control it. Any attempt to swallow during this time loses the field on the mirror, and generally means that the operator has not directed the cannula properly, the oil not entering the larynx. Physical examination of the chest after injection will demonstrate râles until the oil is entirely absorbed.

#### POSITION OF THE PATIENT

In planning the injection, the position of the patient must be considered. The oil follows the bronchial tree generally through gravitation. The explosive action of coughing, however, at times forces the oil in various other areas. If the lower lobes are to be examined, the patient sits directly in front of the operator, inclining to the side to be injected. In the upright position, of course, most of the material will follow the right bronchus, but some will always be found in the left side as well. However, if both areas are not to be studied, incline the patient to the side to be filled. When the middle portions of the lungs are to be injected, the patient should be half reclining, and in case the apices are to be filled, the patient should lie nearly flat and be turned to the side in question. In the latter case it is better to have a tilting table to be used immediately after injection, or at least to allow the head and corresponding arm to hang over the end of the couch in order to get the best possible results. In this case one can visualize only one side at a time.

#### PRECAUTIONS AND CONTRADICTIONS

There are a few precautions to observe whichever method is used. The patient should always be watched for a few days, having a complete

physical examination before injection. The injection should not be done if a high fever is present. Examination of the sputum, general laboratory work, and x-ray plates should always be completed first in order to arrive at a diagnosis and determine the extent of chest involvement. Severe bronchial irritation with considerable cough should be watched with a great deal of care. A few cases of edema of the upper respiratory passages have been reported, but none have been fatal. Any ulceration or severe infection of the larynx should be a contraindication until the general and local condition of the patient is known. An injection should not be attempted for a prolonged period following hemorrhage of any great amount. Active tuberculosis with a high fever is a definite contraindication, as well as any acute lung consolidation with a large amount of expectoration. Naturally, any extensive septic condition should not be studied at that time.

#### RADIOGRAPHIC TECHNIC

The x-ray plates should be taken as soon after injection as possible. This is necessary in order to get a picture of the true condition before the explosive action of coughing has forced the oil into the terminal alveoli, when the superimposed shadows may obscure the bronchial tree. It seems best, especially if the upper lobes are to be examined, to have the injection made on the radiological table. If the patient is allowed to sit up or stand, the areas may drain before the exposure is made. In all cases, an anteroposterior and oblique plate should be made, and in special cases, a lateral plate may give additional information. At times a horizontal plate will be of great help in studying the chest. The plates need more contrast than ordinary films, and as a rule the Bucky-Potter diaphragm is an aid in getting good results.

#### RESULTS IN NORMAL SUBJECTS

It must not be forgotten what the oil is intended to demonstrate and what is to be accomplished by the injection. The bronchial tree and any draining cavities are the areas to be filled. By the injection, areas in the parenchyma outside the tree can be better studied, but these areas cannot be visualized by the opaque media. Any obstruction along the course of the tree can be localized, and the position of the trachea, bronchi and other structures can be demonstrated.

In normal subjects, the trachea, bronchi and lower branches of the bronchioles are definitely seen. The relation of the trachea to the aorta and esophagus is usually shown. The upper and larger passages are only outlined by the oil, but the smaller branches are usually filled, unless not enough material has been used at the time of injection. Bronchial secretions, if greatly increased, may obstruct the flow of oil into the smaller passages. At times the acini are defined, but as a rule the superimposed shadows do not allow study of these very small compartments when they are normal in size.

#### PATHOLOGICAL CONDITIONS

Any obstruction along the course of the trachea from compression in or outside of the upper respiratory tract is easily demonstrated, especially when lateral and oblique plates have been made. This allows study of the mediastinum and demonstrates any pressure masses that may be present.

The use of lipiodol plates instead of ordinary x-ray films in the localization of opaque foreign bodies is not necessary unless the body has been imbedded in the lung for a long time. Here it will help to decide whether it is in the bronchi or lung tissue, and whether a lung abscess has developed. With transparent foreign bodies the injection should give a great deal of information. It can be used for localization, and also will help in studying the surrounding tissue. Care must be taken not to inject too much oil, so as to mask the surrounding field.

The greatest help is found in the visualization of bronchial dilatations, especially when they are too early to be demonstrated by ordinary radiographic plates. This is especially true in hilus lesions and in left-sided dilatations when the area to be studied is behind the heart. The areas usually appear like small clusters of grapes, but may be cylindrical, fingerlike, or branching, depending upon the amount of involvement. If there are abnormal bronchial secretions present at the time, the tree may not be filled, and for that reason all suspected cases of bronchiectasis should receive postural drainage before injection. As stated above, this must not be confused with the condition normally present after coughing, and when not enough of the oil has been injected.

As we follow the tree into the lung tissue, the most important fact to be determined is draining

lung cavities and abscesses. This is where the chest surgeon finds such great help in both diagnosis and prognosis. The position of the open cavities in the lung parenchyma and its close relationship for drainage through the pleura can be ascertained. Abscesses not draining into the bronchial tree may show very little, but study of the parenchyma will still reveal a great deal of information. Tumor masses, such as primary or metastatic growths in parenchymal tissue, can be demonstrated at times by pressure exerted over apparent non-filling areas. Deviation of the trachea and bronchi by mediastinal pressure can be observed. Fistulae and their communication with the bronchi and pleura are best studied in this way. There is a possibility that emphysema, if extensive, may be plated at times.

The relationship of the lung tissue to the pleura can also be determined. Thickened pleura and dense adhesions from previous disease, with deviation of the trachea and bronchi, may not allow proper study of the lung parenchyma. The relationship of old cavities, when the lung has been contracted by scar tissue and possibly by calcified and thickened pleura, is revealed by injection. Many times persistent and prolonged bronchial secretions may have made us suspicious of bronchiectasis, but the diagnosis now can be definitely determined. This is especially true of non-active tuberculosis and cavity formation in the upper lobe with associated bronchiectasis below.

The frequent task of differentiating between localized pneumothorax and possible lung cavities can be more easily accomplished. The uncertainty of the so-called annular shadow should now be removed.

As mentioned above, the chest surgeon should find a great deal of help in deciding the operative procedure to be followed. The question of partial or complete thoracoplasties can be decided. The result obtained can be definitely determined. It is interesting to see how few of the cavities are entirely collapsed by even this new method of treatment if followed by injection. The results of therapeutic collapse of the lung for tuberculous cavities and extensive bronchiectasis can be watched.

It has been stated by some observers that lipiodol seems to have some therapeutic qualities. There seems to be some antiseptic property to low grade bacterial lung infections. A great deal

of improvement has been noted in patients with bronchiectasis, and patients have reported the loss of the foul odor and decreases in the amount of sputum. Healing of chronic fistulae has been noted by some observers. It seems of little value in the treatment of tuberculous cavities. Lung abscesses have at times healed more rapidly after injection. The permanent results in bronchiectasis cannot be determined at this early date, but the psychological effects with the decrease of cough and foul sputum must be a haven of rest for these unfortunate individuals. The treatment of asthma and chronic bronchitis has been tried with varying improvement. At the present time, we have two patients with asthma under this routine. Both were cases of very long standing in which all allergy tests proved negative, and in which all possible foci were investigated. It is too early to make a definite statement as to cure, since psychology may enter into the patient's apparent improvement, just as other methods have done in the past.

In therapeutic treatment, smaller amounts of oil should be used than in diagnostic work. As a rule, 5 to 10 c.c., injected frequently, depending upon the rate of absorption, gives the best results. Different areas of the lung should be injected each time.

#### CONCLUSIONS

1. Injection of iodized oil into the bronchial tree can be done by various methods, none of which cause any irritation and damage to the mucous membrane.
2. The supraglottic method has proved capable of showing any areas demanding study in this small series. No bad effects have been noted, and acute iodism has not occurred.
3. The entire bronchial tree can be followed by repeated injection, and all normal and abnormal pathological cavities draining into the system can be filled.
4. The great advantage of this method of study over ordinary x-ray films is demonstrated in visualizing areas around the hilus, behind the heart, and beneath diseased pleura.
5. The results in collapse of the lung by thoracoplasty and therapeutic pneumothorax can be determined.
6. Annular shadows can be differentiated.
7. The therapeutic action of iodized oil in



some chronic pulmonary diseases offers a new hope for improvement in these patients.

8. This new medium may open the entire field of therapeutics in pulmonary lesions and prove the vehicle for rapid advance in the near future.

right lung, with extensive involvement from the apex to the second rib and between the fourth and fifth ribs on the left side. The heart was normal, both feet and legs up to the knees were swollen and tender, and the skin showed a rather marked petechial eruption. The evening temperature (rectal) ranged from 100 to 100.4

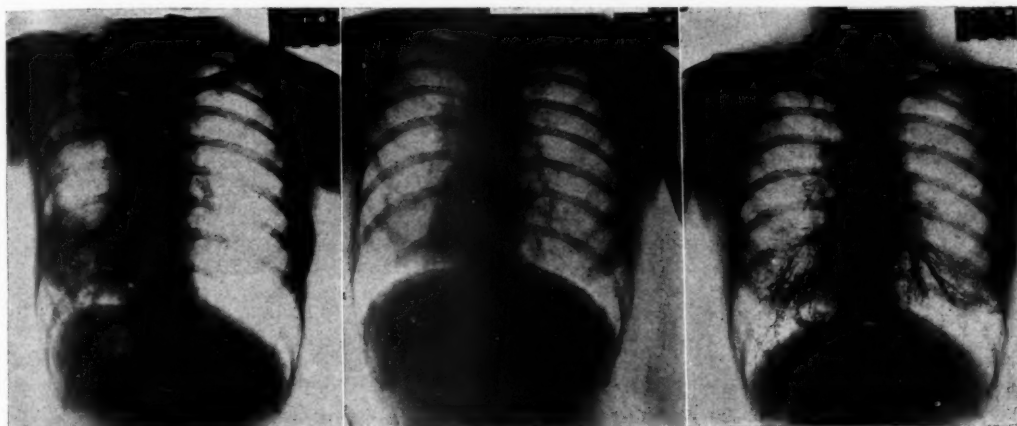


Fig. 1a

Fig. 1b

Fig. 1c

Fig. 1a shows the involvement of the lung upon entrance to the hospital, May 28, 1926.

Fig. 1b shows the improvement on June 26, 1926.

Fig. 1c shows the outline of the bronchial tree in both lower lobes.

Note the infiltration of the terminal alveoli due to coughing soon after injection. The case is presented to demonstrate the normal structure of the bronchial tree. The asthmatic attacks have disappeared since injection, which is offered here as a therapeutic procedure.

#### CASE REPORTS

The cases and material presented here were obtained through the courtesy and co-operation of Dr. F. F. Callahan, Pokegama Sanatorium, Pokegama, Minn.

*Case 1.*—R. C., female, aged 33, was admitted to the sanatorium May 27, 1926. Family history negative. Past history, measles, whooping cough, scarlet fever and diphtheria in childhood. Small-pox at 19 years. Tonsillectomy under local in 1920. Had an attack of bronchitis in September, 1920, which lasted several weeks. She left her home in South Dakota to spend a month in Montana, and the bronchitis seemed to be improved. On returning home, she began to have severe asthmatic attacks which continued for thirteen months, since which time they have been intermittent. She had an attack of influenza in March 1926, which kept her in bed three weeks. She worked one month after having influenza and stopped on account of pain in the left chest, both shoulders, and some cough and expectoration. Her doctor found a lesion in the left lung and two tubercle bacilli in her sputum. A few days before coming to the sanatorium, both feet and legs became swollen and painful, and there was a skin eruption in the same area.

An examination made on May 27, 1926, showed evidence of a slight fibroid infiltration in the apex of the

for about ten days and then became normal. One typical tubercle bacillus was found in the sputum on June 12. The urine was normal. Several blood examinations showed an average red cell count of 4,000,000, leucocytes 15,000, hemoglobin (Sahli) 75 per cent. Differential counts always showed a few polynuclears and eosinophiles from 41 to 60 per cent. Examination of a section of muscle revealed no trichinae. For the first few weeks in the sanatorium she had no asthmatic attacks, the petechia and swelling of the lower extremities disappeared, and she felt greatly improved. After one month in bed, the greater part of the lesion in the left lung had cleared up. All allergy tests were negative. The improvement continued until about August 1, when she began to have frequent and severe attacks of asthma. On September 12, she received an intratracheal injection of lipiodol which caused no general reaction. Following the lipiodol she has had but one attack of asthma, a very mild one on the morning of September 13. Films made of sinuses one week later showed a probable infection of the left antrum.

*Case 2.*—L. G., a student, female, single, aged 19, was admitted to the sanatorium on Aug. 3, 1926. Family history negative. Past history: Pneumonia at four years, and has coughed ever since. Measles at nine years. Examined five years ago, and told that she had bronchiectasis. A tonsillectomy under ether caused no change in her cough and expectoration. She lost



Fig. 2a



Fig. 2b



Fig. 2c

Fig. 2a shows the lung the day of the injection. Note the bilateral infiltration in the lower lobes and the large cavity in the left apex.

Fig. 2b shows the injection of the lower left lobe with slight filling in the left upper and right lower lobes. Note the generalized dilatation of the bronchial tree in the left lower lobe.

Fig. 2c demonstrates the necessity of oblique plates. Note the increased dilatation in this direction over the antero-posterior position.



Fig. 3a



Fig. 3b

Fig. 3a shows the lung before injection. Note the retraction of the heart to the right side.

Fig. 3b outlines the cavity behind the scar tissue and heart. Note the marked deviation of the trachea to the same side. Oblique views do not show any lesion not noted in the antero-posterior view.

weight in the spring of 1926, and her doctor made a diagnosis of pulmonary tuberculosis. The diagnosis was confirmed at the Mayo Clinic.

On admission to the sanatorium she was afebrile, but twelve pounds under her usual weight and was raising copious quantities of viscid sputum in which were found a few tubercle bacilli. The sputum was not foul.

Physical examination: Her left nostril is almost entirely blocked by a crooked nasal septum. The fingers show moderate clubbing. There were râles in both lower lobes, most of which disappeared after expiratory cough. At the left apex there was slight dullness, prolonged on expiration and fine râles after cough. X-ray examination showed a cavity in the left upper lobe with bilateral bronchiectasis which was much more marked on the left side. A lipiodol injection of 20 c.c. in the left lower lobe showed a marked fusiform dilatation of the bronchi in this area. A moderate elevation of temperature and slight headache came on about twelve hours after the injection and lasted forty-eight hours. The sputum was somewhat diminished for about two weeks, but is now about the same as it was before she was given lipiodol.

He was admitted to the sanatorium Aug. 3, 1926. Examination showed marked retraction and fibrosis of the right lung with cavity formation. Heart, mediastinum and trachea were pulled to the right. The left lung showed very slight involvement of the upper lobe with marked compensatory emphysema. Sputum was positive. Intra-tracheal injection of lipiodol was given Sept. 12, 1926, to ascertain the size and location of the cavity in the right lung. The temperature, which had been normal, rose to 103 on September 13, and he had a chill; temperature dropped to 100.4 on the 14th, and became normal two days later.

*Case 4.*—C. P., female, married, age 29. Family history unimportant. Past history: She had pneumonia three times between one and five years of age, whooping cough at six years, typhoid fever at thirteen years (in bed three weeks). The appendix and an ovarian cyst were removed at twenty-two. A miscarriage occurred at twenty-five, and she was sick with influenza two months in the fall of 1918. She has always had a cough, but it has been much worse since a severe attack of bronchitis in March 1926. Since that time she



Fig. 4a

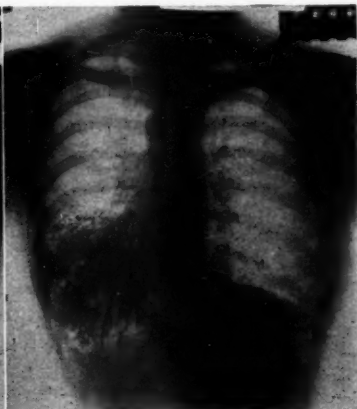


Fig. 4b

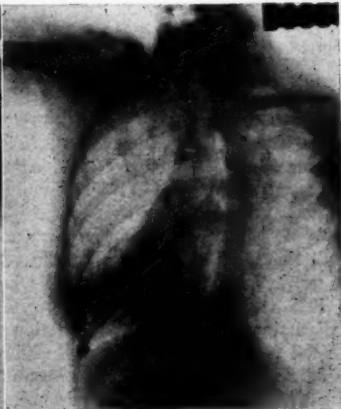


Fig. 4c

Fig. 4a shows the marked infiltration of the left lower lobe, also slight involvement of the right lower lobe.

Fig. 4b again demonstrates the diffuse dilatation of the bronchial tree in the left lower lobe in the antero-posterior view.

Fig. 4c, oblique view of the same case.

*Case 3.*—A. T., is a male, single, aged 38. Family history negative. The patient had a right sided pneumonia in 1910, a fistula in ano in 1916, catarrhal colds in 1918, and influenza the same year, complicated by a bilateral otitis media. This occurred while he was serving in the A. E. F. He was transferred from a hospital in France to Fort Baird for tuberculosis. Discharged from Fort Baird as a total permanent disability in 1920, he improved until 1923, when fever occurred again for a few months. He had pleurisy in December 1925. The right tonsil was removed in May 1926; he coughed very hard for the next few days and has not felt very well since.

has raised several ounces of foul sputum daily. She has lost 26 pounds, and feels very weak and tired.

An examination made Aug. 17, 1926, showed râles over both lower lobes, with dullness and broncho-vesicular breathing over the left lower side. Stereo films showed a marked bronchiectasis in the left lower lobe and some bronchial changes in the right lower lobe. She was given bed rest and postural drainage for one month. Her tonsils, which were badly diseased, were removed under local anesthesia. She was seen again on September 26, and there was no change in her condition. After draining posturally we injected 20 c.c. of lipiodol into the left lower lobe. There was a slight

headache following the injection, which lasted 48 hours. On October 17, she reported a marked diminution in sputum, with a loss of the foul odor and a gain of eight pounds in weight. She thought the sputum had increased a little during the past few days.

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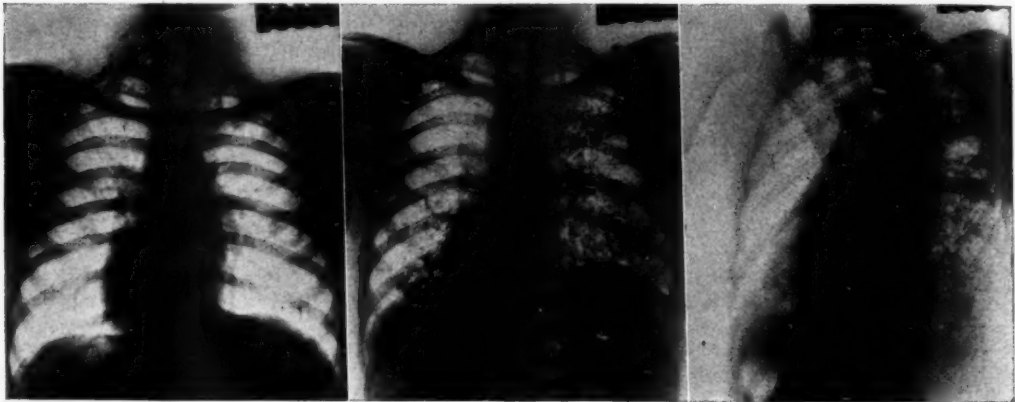


Fig. 5a

Fig. 5b

Fig. 5c

Fig. 5a shows the lungs before injection. Note the area interpreted as an annular shadow between fourth and fifth ribs, right side.

Fig. 5b, an antero-posterior view of the same case after injection. This demonstrates the ability of injection of the upper lobe by this method. Note the disappearance of the annular shadow. This picture eliminates any possibility of cavity formation in this case.

Fig. 5c, an oblique view, which brings forth the beginning bronchial dilatation in the right hilus, showing up as finger-like processes.

**Case 5.**—K. P., male, aged 20, single, was admitted to the sanatorium Oct. 27, 1925. Family history negative. Measles and whooping cough in childhood. Tonsillectomy at eight and fourteen years; ether anesthesia both times. Had pneumonia while attending school in Ames, in January 1925, remained in hospital until April 1, 1925, and has not been well since.

Examination showed an infiltration from apex to R2 on the right side, with an area of involvement in the middle of both lungs. His sputum was consistently negative for tubercle bacilli. He occasionally had from 1/2 to 2/5 degree elevation of his evening temperature during the first month at the sanatorium. He was discharged apparently arrested June 9, 1926. He had an attack of influenza in July which caused him to cough and expectorate. The sputum was positive for the first time, and he returned to the sanatorium August 25 for advice. He had lost nine pounds, but had no fever. Examination showed a marked pharyngitis and laryngitis. The sputum contained tubercle bacilli. Under treatment the pharynx improved in a very short time, and his cough and expectoration ceased. X-ray films of his sinuses showed involvement of the left antrum, with a probable fluid level. There was no apparent change in his lung examination. There had always been an area in the right lung which we had interpreted as an annular shadow. Lipiodol was given September 12 to ascertain the real status of this shadow. He had no general reaction following the lipiodol.

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THE CARBOHYDRATE PROBLEM IN  
INFANT FEEDING\*

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The object of this paper is not to offer something new but rather to impress upon those managing infant dietaries the importance of a balanced carbohydrate content, by presenting the actual need, the methods of meeting this need, and the consequences of unbalanced carbohydrate diets.

According to the Talbott Scale, on an average, a baby needs 500 calories of food a day by the end of the first month, and the caloric need increases proportionately with its increase in weight until the child is getting approximately 900 calories at the end of the ninth month. Ninety per cent of the energy intake is available for the purposes of the body while only 10 per cent is lost as excreta. Muscular activity, kicking, crying and restlessness of all sorts may use up as high as 25 per cent of the available energy supplied by the food; basal metabolism requires 40 per cent. This leaves only about 25 per cent of the energy of the ingested food to be utilized for the purpose of growth.

It is an accepted fact that the normal infant thrives on two ounces of cow's milk per pound of body weight per day. Holt and Fales,<sup>1</sup> in their investigations on nursing infants, found that they took daily, on an average, about 12 grams of carbohydrate per kilogram of body weight. Artificially fed infants usually received somewhat more than this. Julius Hess<sup>2</sup> advises one-eighth to one-fifth of an ounce of sugar per pound of body weight per day. This is utilized chiefly to provide heat and energy.

However, we must take into consideration other factors than the mere caloric requirement. Vitamines play a necessary part in the rôle of stimulating normal metabolism and promoting proper growth. But neither the caloric requirements nor necessary vitamins are sufficient. We must also consider the availability and digestibility of different forms of food, in this paper, particularly with regard to carbohydrates.

## CARBOHYDRATES USED IN INFANT FEEDING

Needless to say, only those carbohydrates most

commonly used in infant feeding can be considered here.

1. *Milk sugar (lactose).*—This sugar would seem the natural one to use as it comprises 7 per cent of human milk. But it is an established fact that its addition to cow's milk to obtain the correct percentage leads to disaster. It has been assigned the leading rôle in initiating all digestive disorders that are fermentative.

2. *Cane sugar (saccharose).*—This sugar is probably most commonly used as a routine for normal infants. Brenneman<sup>3</sup> states that it has been used as a routine with great success in the infant welfare work of Chicago for a number of years and says that Jacobi always advocated it in place of milk sugar.

3. *Dextrine-Maltose preparations.*—The most common of these are: Mead's Dextro-Maltose, Mellins Food, Horlick's Food, Nestle's Food, Karo Corn Syrup, Keller's Malt Soup, Borchardt's Malt Sugar, etc. During recent years this form of sugar has come into extensive use in infant feeding. Experiments by Flood<sup>4</sup> in plotting the blood sugar curves of newborns after the ingestion of various sugars brought out the following facts:

1. Sugars have different rates of absorption.
2. Dextrose is the most readily absorbed of the monosaccharides, galactose next, and then levulose.
3. The disaccharides showed some of the characteristics of their component monosaccharides.

Thus we see that the absorption of any polysaccharide depends upon two factors: first, speed and ease with which it is hydrolysed into its component monosaccharides, and, secondly, upon the specific absorption rate of these monosaccharides. Flood further concludes that those sugars, namely, dextrose, maltose, and Karo corn syrup, which when completely hydrolysed give only dextrose, clinically are noted for their ease of absorption and non-laxative action. They are ideal foods for bottle fed babies under six months. Lactose and cane sugar, which are slowly or not entirely absorbed in the newborn, have a laxative action but are more readily utilized with advancing age. This explains the clinical experience that dextrin-maltose preparations are more acceptable to atrophic or weak babies with digestive disturbances, and to all cases in which there is a tendency to fermentation.

\*Read before the Stearns-Benton County Medical Society, Clearwater, Minnesota, Sept. 23, 1926.

4. *Starch*.—This is used in infant feeding to meet several needs. It has been found to be well tolerated in the form of cereal water in early infancy and a child of three months can successfully digest it as a cooked cereal. Starches cause a finer curd formation in the stomach and materially add to the value of the food.

#### UNBALANCED CARBOHYDRATE DIETS

1. *Insufficient carbohydrates*.—Babies fed insufficient carbohydrates show the following: (1) Retardation of development; (2) stationary or loss of weight; (3) loss of body turgor; (4) constipation; (5) soap stools; (6) loss of body alkalis; (7) low body temperature; (8) acidosis; (9) anemia and malnutrition in older children.

2. *Excessive carbohydrates*.—When the concentration of sugar solution is too great the result is an irritation of the gastric mucosa. Certain saccharolytic bacteria that feed on carbohydrates, namely, *bacilli bifidus* and *acidophilus*, form split products—acetic, butyric, lactic, formic and carbonic acids. These cause a dilatation of the stomach and produce a pyloric reflex resulting in distress, and vomiting of small amounts of sour smelling, watery, curdled fluid which is acid in reaction.

Two factors cause sugar fermentation—unabsorbed sugar in the intestine and bacteria. Normally the small intestine is comparatively sterile, while the large intestine is crowded with bacteria. Therefore when the sugar concentration is too great a considerable amount of undigested sugar finds its way lower than is normal in the digestive tract, and bacteria attack it, causing sugar fermentation. This results in colic, frequent watery acid stools containing mucus, and excoriation of the buttocks.

A highly concentrated sugar solution, if digested and absorbed, causes water retention in the body and a rapid increase in weight is noticed. However, the flesh is fat and flabby, the child has a reduced immunity to diseases, and is very prone to develop rickets. Holt<sup>5</sup> says, "The easy digestion of foods, consisting chiefly of soluble carbohydrates such as sweetened condensed milk and the proprietary infant foods and the rapidity with which children so fed gain in weight, lead to a great misapprehension, in regard to their value as foods." These sweetened condensed milk mixtures are also harmful to the teeth. Durand,<sup>6</sup> in a report of findings in an ex-

amination of 2,000 children from two to seven years of age, found that the incidence of tooth caries in breast-fed and those fed on cow's milk mixtures was 42.7 per cent, and in those having a diet of sweetened condensed milk the percentage was 72.1. Thus to obtain healthy growth a proper carbohydrate balance is essential.

3. *Tolerance for carbohydrates*.—In general, infants have a high carbohydrate tolerance, especially the normally constipated baby; but some do not handle sugar well. Among these latter, gastro-intestinal disturbances, eczema, etc., are common. Other conditions predisposing to carbohydrate intolerance are parenteral infections, such as rhinitis, pharyngitis, tonsillitis, bronchitis, pneumonia, otitis media and pyelitis. Infants suffering from these infections are likely to develop a diarrhea due to the lowered functional capacity of the gastro-intestinal tract. The probable reasons for this are: (1) In these conditions the digestive juices are reduced in amount so that the sugar is not digested or absorbed as well as normally, and hence is fermented; (2) a lowered bactericidal action of the intestinal mucosa is probably present. Overheating the body is also a cause of sugar fermentation, as evidenced by the large number of summer diarrheas. The explanation of this is similar to "parenteral infections" diarrhea. Sugar fermentation may also be brought about by nervous exhaustion and excitement, probably in a way similar to that in which it is brought about in the former two conditions. There is also reduced tolerance for carbohydrates in prematures and congenitally inferior infants, due to the insufficient production of the digestive juices.

As brought out in the first part of this paper, the dextrin-maltose preparations are the most easily digested and absorbed; thus infants with a lowered carbohydrate tolerance will do well upon gradual additions of this type of carbohydrate. In this connection Brenneman<sup>7</sup> states that "whenever there is a tendency to diarrhea, the dextrin-maltose preparations and especially those relatively high in dextrans and low in maltose are tolerated in larger amounts than are cane sugar and milk sugar." Starch in normal conditions in therapeutic amounts is constipating as compared with sugars. In diarrhea, it requires the same vigilance in larger amounts as do the sugars, although in older infants, after the sixth month, it is commonly much better tolerated than the sugars. In smaller amounts, starch is apparently

always tolerated, as is evident from its wide use as barley water and rice water, as the sole food in diarrheas, where a therapeutic starvation is indicated. Julius Hess<sup>8</sup> holds this same view.

#### CONCLUSIONS

1. Cane sugar is probably the most commonly and most successfully used carbohydrate in the artificial feeding of infants.
2. The dextrin-maltose preparations have recently been shown to be the carbohydrate of choice for infants with a lowered carbohydrate tolerance.
3. The early addition of starch, in the form of cereal waters, gruels and cooked cereals is advisable.

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#### CASS TREATMENT FOR RHEUMATISM

One hundred and thirty-seven West Sixty-Second Street, Chicago, houses a choice line of quackery. Under the names "Western Medical Association" and "Vernon Laboratories" a fake "epilepsy cure" is exploited on the mail order plan. Under the name "Cass Laboratories," nostrums for rheumatism, sciatica, neuralgia, lumbago and gout are sold—also through the United States mails. The A. M. A. Chemical Laboratory reports that the "Cass Treatment" consists of pink tablets, "Special Saline Compound" and gray tablets. The Laboratory found the pink tablets to contain 0.6 Gm. of sodium bicarbonate per tablet. The "Special Saline Compound" was found to be essentially flavored magnesium sulphate. The gray tablets were found to contain essentially 0.16 Gm. acetyl-salicylic acid, 0.13 Gm. cinchophen and 0.3 Gm. charcoal per tablet. From the Laboratory's report it is seen that this wonderful discovery "developed under the direction of the Head Professor of Chemistry at one of the nation's largest Universities," and declared by "two of the foremost Medical Scientists in this country" to be superior to anything else in its line, is merely a combination of acetylsalicylic acid and cinchophen with sodium bicarbonate and magnesium sulphate. (*Jour. A. M. A. Jan. 15, 1927*, p. 189.)

#### MINNESOTA AS A HEALTH RESORT\*

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St. Paul

The study of climatology and its relations to the rise and fall of civilizations, the fate of nations, and the changes that have taken place in special localities throughout the centuries, is fascinating. The destiny of population in any country is largely determined by its climate. The fertility or barrenness of the land, the distribution and virulence of its parasitic diseases, the occupations and habits of its inhabitants are the direct result of climate. In other words, climate exerts a powerful influence upon man's health and activities, and has been the activating force that has started the great migrations that have distributed man over every habitable portion of the globe.

Turn for a moment to the histories of the countries grouped around the eastern end of the Mediterranean Sea. Mesopotamia, in the fourth millennium before Christ, was the most fertile country of which there are any records. It was the famous country of the Amorites, rulers of Babylonia. Wave after wave of conquering peoples swept over this favored spot. The Semitic invasion was followed by the Scythians, then came the Medes and Persians, each wave falling under the influence of the climatic energy of the region, and prodded on by its stimulation kept in the front ranks of the leading civilization of the world until violently displaced by new invaders. The climate of this region to-day is not one that breeds energy in its inhabitants, but on the contrary is one better fitted to extinguish any sparks of energy that might spring up. The climate through the past ages has undergone a slow but sure change from one best adapted to man's requirements to one of the worst.

Syria has suffered in the same way. Now little better than a desert, its twenty thousand square miles at one time supported a population more dense than any we are acquainted with in the world of to-day, except in and immediately around our largest cities.

Greece and its islands, Egypt and later Rome were not only the victims of this same climatic

\*Address of the retiring president of the Minnesota Trudeau Medical Society, September 1926, also made before the Lymanhurst staff meeting, November 1926.

change, but also of the appearance of the malaria mosquito in their marshes and shallow pools, which, undisturbed by frequent storms and rains, became ideal breeding places. Thus the Greeks were dethroned from the position of the most cultured of races, not only by the loss of a stimulating climate but also by the appearance of malaria, a physically and mentally enervating disease, almost equal to the hookworm.

The climate of central Asia has also undergone a complete change in the last three thousand years. Professor Elsworth Huntington of Yale describes thousands of square miles in Chinese Turkestan formerly thickly wooded, where the forests have died from the lack of water, but which still stand, gaunt skeletons of their former glory, preserved from decay by the absolute dryness of the air. He also points out that Syria, which never was covered by forests, is now just as dry, and hence changes in the rainfall of a country cannot be attributed to deforestation but to the hypothesis of pulsatory climate changes due to a shifting of the storm belts on the earth's surface. Changes of such magnitude take place slowly and in huge waves. That they have taken place is taught by the philosophical study of history and by the mute testimony of such witnesses as the ruins of towns in Asia, Africa, and the New World in places absolutely unfit for human habitation at the present time; by old irrigation systems in districts now far too dry to yield water for such uses; old bridges over dry river beds; and on the other hand, by places formerly dry but now wet, as shown by ruins found in swamps in Ireland or in lake bottoms, and by old irrigation works in districts now having a heavy rainfall. The theory of great changes in climate through long spaces of time, is also upheld by the study of the rings of growth in the great trees along our Pacific coast. As some of these trees prove to be more than three thousand years old and a large number over two thousand, they furnish most reliable evidence of the wet and dry periods they have passed through, the dry or wet phase often extending through a century. Such prolonged dry epochs are credited by historians with starting the hordes of barbarians that flowed at different times from Asia across Europe, some even to the walls of Rome.

The destruction of some civilizations has been due to a complete change of climate, the result

of the slow and pulsatory shifting of the storm belts and consequently the loss of the energizing element of the climate and the capacity of the country to produce sufficient food. Both the animal and vegetable worlds suffer alike in such disasters. The history of the Maya civilization of Central America, the most advanced civilization of the Western hemisphere, is a good illustration. They had a culture far ahead of that of the Incas of Peru. Their astronomers had developed the most exact calendar known, next to the one in general use to-day. They had a written language. Their architects built temples several stories high and as much as four hundred feet long, decorated with sculpture. Their cities covered square miles of territory. Their energy was prodigious, as these great works were erected with copper as their only metal and without the assistance of any beasts of burden. These wonderful achievements were made in a country which at the present time consists of hot, damp, low lands, infested with malaria, with no agricultural possibilities and no climatic energy to stimulate its inhabitants. These towns were eventually deserted and the inhabitants moved to northern Yucatan, probably on account of a complete change of climate.

The essential elements of climate stated approximately in the order of their importance are temperature, humidity, storms, sunshine, and atmospheric pressure. Our ordinary cyclonic storms are an exceedingly important constituent of climate, bringing variations in all of these elements from day to day. All of these variations are stimulating and are at the bottom the source of the climatic energy which pushes the inhabitants of regions so blessed, to the highest point that their degree of civilization and inheritance is capable of reaching. Human health, energy and efficiency vary with climates and in the same climate with the seasons. Changes are in themselves stimulating; the most depressing element of tropical climates is their uniformity. A long residence in the tropics or the arctic regions, climates so different, has the same deadening effect upon energy and initiative.

Studying the distribution of human energy, efficiency, and health with Professor Huntington, demonstrates that civilization makes most progress where the climate is most propitious; that the leading peoples of to-day are to be found in western Europe from northern Italy to



the southern portions of the Scandinavian peninsula and in North America in a belt extending across the continent from the mouth of the St. Lawrence river to the Carolinas, thence sweeping westward to the Rocky Mountains, including the region of the Great Lakes. In other words, civilization makes its greatest advances in a variable temperate climate, which far surpasses steady and continuous good or bad weather in its effects upon human health and efficiency.

By applying this scheme of climatology to our own district, we see that we reside in one of the world's stormiest regions, in the belt of many cyclonic storms, which are of vastly more importance than the range of temperature from season to season, and which insure that priceless element of variability with its powers of stimulation, upon which the health and efficiency of man, the fruitfulness of the soil, and the advancement of the race so largely depend.

Parasitic diseases were not found in Minnesota by the earliest settlers. The United States Army recognized the natural salubrity of the climate and sent regiments enfeebled by the malaria of the South to recuperate at Fort Snelling. As a local writer expressed it, soldiers were stationed at Fort Snelling to recover from their exposure to the pestilential climate of the South. In 1840 there were forty-five cases of intermittent fever among a thousand soldiers at the Fort. Many settlers came up the river in steamboats and probably brought the anopheles along as fellow travelers. A physician in one of the river towns reported in 1852 that he saw seventy-five cases of ague during the summer in a population of thirty whites and three hundred natives.

Dr. J. I. Head, U. S. A., Fort Ripley, wrote that in no instance had intermittent fever been known to have had its origin in the territory, although the Fort is surrounded by conditions which appear in more southern latitudes to favor the development of malaria.

Later recent immigrants introduced typhoid fever probably contracted on board the trans-Atlantic ships. Some members of the profession contended that these were cases of typhus.

The first recognition of Minnesota as a health resort, was the use of Fort Snelling by the Army as an anti-malarial post. This reputation gradually grew, until, after the Civil War, Minnesota became the most popular health resort in the United States, especially for patients suffering with tuberculosis. Dr. R. I. Trall of New York

bears the following testimony to this fact: "The clear, dry, bracing atmosphere and invigorating climate of Minnesota has long enjoyed a world-wide reputation, especially in cases of incipient consumption, and has been extensively resorted to by invalids from the Eastern States and Europe." Many of these visitors from the eastern states settled permanently in the Twin Cities, and not a few of the leaders of to-day are their descendants. Edward Livingston Trudeau was among these health pilgrims, whose name has become a household word throughout the length and breadth of the land, whose monument is the famous Saranac Sanatorium, and in whose honor three state medical societies have taken his name as the sign that they are the tuberculosis societies of their respective states.

At the meeting of the Minnesota State Medical Association in 1871, the report of the committee on climate brought forth a debate participated in by practically all the members on Minnesota as a Health Resort.

The short and condensed report of the committee was as follows: That a sojourn in Minnesota was beneficial to the incipient stages of consumption. That the climate benefited tuberculosis because it favored the processes of nutrition. That the climate was on trial.

The majority of the members in the discussion which followed the presentation of the committee's report, took the position that the health seekers were not given an opportunity to rest, which was the most important element in their recovery, but were rushed here and there, on almost daily excursions, more to their detriment than their improvement. They all appreciated the harmful advice, all too common even fifty years later, to go West, get a horse and a bottle of whisky and try roughing it for a season. They also expressed themselves as being opposed to short visits instead of a stay of a year or more, as the latter was productive of much more lasting results. And lastly they were unanimous that advanced cases should be dissuaded from undertaking such a long difficult journey, which was almost certain to end in disappointment and unnecessary suffering.

Several physicians, who had come to Minnesota because they had had pulmonary tuberculosis, gave short recitals of their personal experience. Dr. Murphy had resided in St. Paul twenty-two years, had gained in weight from 130 to 225 pounds and was strong and vigorous. Dr.

Sheardown after fifteen years residence weighed two hundred pounds and enjoyed excellent health. Dr. Brewer Mattocks, who had published a book on "Minnesota as a Home for Invalids," took a prominent part in this debate, holding that Minnesota's climate was bracing and stimulating. He had observed that the majority of the consumptives stayed too short a time, ran about altogether too much, and that most of them died within two years of the time they returned to their homes.

This statement was true in the case of that remarkable man Henry David Thoreau, who came to Minnesota early in 1861 on account of his health. He spent the short time he was here in excursions and social visits, botanizing and observing the habits of gophers and other small animals. He died within the two year space allotted by Dr. Mattocks. When it was stated before the Minnesota State Medical Association that the climate of Minnesota was on trial, the committee evidently had the idea that the climate would ultimately be shown to be able to heal tuberculous lungs. The discussion revealed that the membership did not have such faith unless the pilgrims were willing to follow certain rules of hygienic living. The great majority of these pilgrims and even some physicians believed in the existence of a curative property in the atmosphere. This idea was encouraged by the propaganda sent out by the territorial and state governments as early as 1850. For instance: "With proper care and no unnecessary exposure, it may be safely said that coughs, colds, and that scourge of the Eastern States, consumption, would be almost entirely unknown. No climate is better adapted for its speedy eradication." Or this: "The whole winter is a radiant and joyous band of sunny days, and star-lit nights. It is the

most normal climate on the continent. No other is so exquisitely symmetrical in its entire annual development."

As usual in testimonial literature, preachers are numerous. An Eastern divine writes: "The winter is intensely cold, yet so dry and clear and still that one who is properly dressed finds the climate much more agreeable than the amphibious, half fluid, half solid, grave-like chill of the East." Another contributes this: "It is an everyday experience to meet with residents who came to Minnesota one to ten years ago for their health. Every train brings its quota of invalids. There are witnesses by the hundred to testify to the healing virtues of this climate." Unfortunate multitudes of suffering consumptives flocked to Minnesota with high faith in the healing virtues of its climate. Their faith was not rewarded, and gradually this stream of deluded pilgrims turned their faces to the southwestern states where others like them still wander, ever seeking that promised land whose air carries balm and healing but which does not exist on this side of the great divide. And thus, Minnesota lost her reputation. *Sic gloria mundi.*

Minnesota's climate has changed but little in the past century, except that the atmosphere of our most thickly settled areas is not free of the contamination which industry produces. Minnesota stands in the front rank of Professor Huntington's maps showing the distribution of human health, energy, and efficiency throughout the world. The inhabitants of Minnesota, blessed with a stimulating climate charged with climatic energy like that of the ancient country of the Amorites, have fallen heir to conditions which set no limit to their possible achievements except that of their own capacities.

#### INFLUENZA DEATH RATE INCREASES DURING 1925

The death rate for the registration area of the United States was 11.8 per 1,000 population during the year 1925. This is almost the same as that of the previous year. The principal decreases in death were from measles, pneumonia and tuberculosis, says the report in *Hygeia*. However, these decreases are not especially significant.

The influenza death rate increased as did that of diseases of the heart and of the kidneys. The number of deaths from diarrhea and intestinal inflammation in babies also rose.

#### DIAMEL IN DIABETES

Diamel tablets are manufactured by the Maltbie Chemical Co. They are stated to contain "Lithium Carbonate 1½ grs.; Sodium Arsenate 1/20 gr.; Strychnine Arsenate 1/180 gr.; Ext. Jambul Seed ½ gr.; Ext. Gentian, ½ gr." The product is marketed with the claim: "This tablet is employed for the reduction and elimination of sugar in the urine, which it is said to do rapidly. A trial will speedily prove the efficiency of this formula." None of the components of Diamel tablets have any specific effect on the course of diabetes. (*Jour. A. M. A.* Jan. 22, 1927, p. 267.)

# MINNESOTA MEDICINE

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## EDITORIAL

### An Imperative Need

The vanguard of the encephalitic is forcing its way, with the exception of New York, into all our State Hospitals. An encephalitic psychosis, which is uncommon in the adult and very rare in children, is with reluctance received by our state institutions. The behavior disorders of the encephalitic child and adolescent is the difficult problem. What proportion these behavioristic changes bear to the total number of encephalitics is unknown; they are certainly much greater than we have supposed; in the adult their occurrence is rare. Wimmer states that some of these encephalitic cases "are too sane for an insane hospital, but not sane enough for home care; in the ordinary hospital they have no place." Auden believes that under proper medical, educational and environmental care many of these patients

would gain self-control, moral balance, and would be able to take their place in life. "Encephalitis," says Economo, "gives us an entirely unexpected insight into psychological and physiological mental mysteries of mechanism." An intensive study of personality undergoing a gradual disintegration would throw much light not only on encephalitis, but also on the behavior disorders observed in cerebral trauma, chorea and lues which resemble the milder phases of those observed in the former disease.

In London the Metropolitan Asylum's Board a year ago established an encephalitic experimental unit for children from three to sixteen years of age. One hundred thirty-three patients were admitted; the curative results have been far from satisfactory. The Superintendent, Dr. Borthwick, advises a period of residence at a hospital school, with the ultimate hope of achieving ordinary citizenship from those suffering from behavioristic disorders. Two notable experiments are being conducted in this country for the encephalitic child and youth. In 1924 Drs. Bond and Partridge<sup>1</sup> began their investigations with a class of ten boys between eight and twelve years of age. The boys were badly behaved, but intelligent. Aside from strabismus there was no evidence of any gross brain lesion. They were manageable, made fair progress in education, and their behavior was improved.

The State Hospital Commission of New York about the same time began sending to Dr. Raynor at Kings Park State Hospital, children suffering from the after-effects of encephalitis or of some similar disease. They were of both sexes and of all ages up to seventeen years. Those with the Parkinson Syndrome and those having low intelligence quotients were received. They occupy a separate cottage, and excellent work is being done. This group, however, is not so favorable for experimentation. In the State of Pennsylvania there is to be set apart a special cottage at the Allentown State Hospital—at least the children are to be separated from the adult population. Here the behavior difficulties are to be concentrated (Bond).

The State Board of Control of Minnesota has built at Rochester a cottage for encephalitics which will house some 40 patients, twenty male

<sup>1</sup>Post-encephalitic behavior disorders in boys and their management in a hospital. Earl D. Bond, M.D., and C. E. Partridge, Ph.D., Department for Mental and Nervous Diseases, Pennsylvania Hospital. Am. Jour. Psychiat., July, 1926.

and twenty female. No sub-normal children are received. The sexes occupy separate quarters in the same cottage. Violent and disturbed cases are committed to the State Hospital and are being cared for in the wards with the better class of adult patients. It is the purpose of the Board of Control to have a carefully planned program of education and treatment for these children.<sup>2</sup> The funds necessary for its operation are still to be appropriated by the State Legislature.

"The chief need," says Bond,<sup>3</sup> "is complete segregation not only from adults but from other types of badly behaved children. The bright boy should be absolutely separated from the dull one, and the younger children from the older ones, and the boys from the girls."

While this endeavor on the part of the state authorities in New York, Pennsylvania and Minnesota shows most commendable foresight and promptitude in meeting an imperative need, personally I do not approve this form of procedure. An attack of encephalitis does not change or modify the course of a precox or a manic-depressive attack—it may bring to the surface a unitary psychosis, which, when the encephalitic illness will allow, should be transferred to a state hospital. The encephalitic toxic psychosis should be cared for in the special hospital set apart for them. These behavioristic patients should, I believe, be segregated in a special neuropsychiatric hospital or an experimental encephalitic unit built on the cottage plan. There should be a well equipped laboratory, and no connection with a state hospital or a state reformatory; it should afford every facility for intensive medical study and treatment, and it should be located at a medical center. Neuropsychiatrists and psychologists under these conditions would be given every opportunity to observe the reactions occurring in diseased mental mechanisms. Only teachers and nurses familiar with child psychology should be employed. A pleasant environment, occupational therapy and healthy recreation is imperative. The Scottish Investigation in Mental Inefficients showed that more offenses were committed on Sundays than any other day, and that the two other most unsatisfactory days were half-holidays—Wednesday and Saturday (Potts).

<sup>2</sup>Personal communication, Blanche L. LaDu, State Board of Control.

<sup>3</sup>Personal communication, Earl D. Bond, M.D., Physician in Chief and Administrator, Department for Mental and Nervous Diseases, Pennsylvania Hospital.

For these wards of the state, custodial care and punitive measures are alike futile. Such a hospital opens a vista of research and splendid endeavor dazzling in its possibilities of accomplishment. Only under such favorable conditions for study and clinical observation is the discovery of the Aradne clue to the behavioristic disorders not only of encephalitis, but those also arising from other causes as well, made possible.

The building of such an hospital appeals equally to the scientist and the humanitarian. Human salvage in the child and adolescent is a matter of supreme importance from both an economic and sociologic standpoint.

C. EUGENE RIGGS, M.D.

### Mental Diseases and Childhood

The leading article in this number of the journal by Dr. George Donohoe offers a great deal of food for thought. Written in a manner that a layman can understand, it deals with problems which all parents have to face.

It seems evident that mental diseases in this country are on the increase in percentage as well as in actual number due to growth of population. That hospitalized mental cases outnumber all other hospitalized cases is a serious state of affairs. And that only a comparatively small percentage of mental patients are curable emphasizes the importance of prevention.

The incidence of certain types of mental disease is said by some to be greater in inferior stock. That is rather putting the cart before the horse. That is one reason why such stock is inferior.

No one is in a better position to observe the results in mental derangement of violation of moral codes than the physician. Syphilis, excessive use of alcohol, addiction to drugs are responsible for a host of mental cases which are preventable. And the subjects themselves are not the only mental sufferers. The effects on innocent members of the family often lead to psychic complexes which in time become true psychoses.

The method of attack in the prevention of organic brain lesions is fairly clear. The primary cause must be prevented and progress can only be expected as syphilis, arteriosclerosis, cancer, encephalitis, etc., are overcome. The prevention



of so-called functional brain diseases is more complex and requires considerable analysis. Heredity and environment both play important rôles. The training of the child, particularly the one with a poor heredity, so as to enable him to cope with the complex life of today is emphasized by Dr. Donohoe. It is a difficult task to rear a child nowadays when it is not fashionable to have principles, when orthodox religion is not popular, when respect for law is a joke, so that the youth of college age will have acquired rules for his behavior which will enable him to meet situations without undergoing mental conflicts.

Dr. Donohoe's classification of children into two groups which he calls introverts and extroverts is a new one. It does seem possible to look back and classify certain of our childhood acquaintances as outstanding examples of one or the other group. Doubtless many children are a mixture of the two. The difficulties of adjustment for the introvert at the transition period from childhood to young manhood or young womanhood are tremendous. These are the individuals who become introspective and develop peculiar traits or obsessions. The adaptation of religious precepts to modern day life is not easy at best and these are the individuals who may become over-religious to the point of abnormality.

Children see, hear and discuss certain subjects at a much earlier age than a generation ago. The movie has contributed much in this regard. The growing interest in the psychology and training of children is evidenced by various activities such as the juvenile courts, child guidance clinics, and magazines devoted to the training of children such as the one now in its second year entitled "Children—The Magazine for Parents."

General practitioners as well as psychiatrists frequently have the opportunity to correct environmental conditions which are likely to lead to serious mental disorders. Prevention of this sort is highly important.

### The Conference of Secretaries

There is no more important officer of any society than the secretary. The society's achievements depend largely upon the energy and ability of the secretary and this is particularly true of the medical society. The president is elected usually for one year—secretaries go on until they resign. The office of president is bestowed

upon a member in recognition of his ability and standing among his fellow members, and is rightly esteemed an honor. The secretary of a county society should be elected for a minimum of three years as pointed out by our president, Dr. W. F. Braasch, at the recent conference of county secretaries held at the St. Francis Hotel, St. Paul, February 8. It takes time to "get on to the ropes" of such an important job.

The conference of county secretaries inaugurated by Dr. E. A. Meyerding, our state secretary, was well attended and these representatives of the component units of the state association had the opportunity of hearing first hand of the various activities of the state organization. The morning was devoted to a discussion of legislative activities, the Basic Science and Medical Practice Bills particularly. The Committee on Public Policy and Legislation, of which our former president, Dr. H. M. Johnson, is chairman, has been very active in the furtherance of much needed legislative measures.

At the afternoon session our president emphasized the importance of the county society as a unit in the state organization, the responsibility resting on the shoulders of the secretaries, and the need for concerted action.

Dr. George Earl, chairman of the Public Health committee, outlined the various methods which the committee proposes to employ in placing medical facts in the hands of the public. It was pointed out that it is highly desirable for each county society to be in touch with local newspapers in order to be of assistance when called upon by the newspaper editors. There are some sixty-odd national organizations which are concerned primarily with phases of public health. Many counties and cities have various organizations of a similar sort whose activities are primarily medical. The importance of medical representation in the management of such organizations is only too evident. The Hennepin County Medical Society has been more alive to the situation than other county societies.

Radio broadcasting of medical subjects was discussed by Dr. E. H. Norris, chairman of the committee on broadcasting. It seems that anonymous broadcasting is frowned upon by the radio managers and the State Medical Association has taken a stand against broadcasting by its members in private practice. This leaves a limited field from which the committee can draw.

MINNESOTA MEDICINE became the subject of some discussion. It was felt that the journal had sacrificed convenience in make-up for appearance's sake. The Editing and Publishing Committee has decided to act upon the suggestion and replace the table of contents in its former position on the cover of the magazine, beginning with the present issue.

A sample of a certificate of membership in the State Association which will be sent to each member for framing and office display was exhibited. At the last annual meeting of the Association it was felt that an M.D. certificate of this sort would be worth while.

The whole tone of the conference may be summed up in the idea of the importance of concerted action. With the officers and committees doing their part and the individual members contributing the wherewithal the Association should be able to increase its efficiency and carry out the various purposes for which it was formed.

## COMMUNICATIONS

Baltimore, February 3, 1927.

### TISSUE DIAGNOSIS IN THE OPERATING ROOM

And Immediate Cover-slip Examinations of all Fluids and Pus

Dear Sir:

I will consider it a courtesy if you will publish this letter in your journal, as I am anxious to come in correspondence with pathologists and surgeons interested in the immediate examination, by frozen section, of tissue in the operating room and the immediate cover-slip studies of smears from all fluids and pus.

Microscopic examination of stained frozen sections has been possible for more than a quarter of a century. The staining of unfixed frozen sections with polychrome methylene blue and other stains is a well-established procedure. In many operating rooms in university and other large and small surgical clinics, provisions for these immediate diagnostic studies have not only been available, but have been in practical use for years. While, unfortunately, on the other side, this diagnostic part of the operating room is conspicuous by its absence in many clinics.

Before 1915 it was rarely necessary for a surgeon well trained in gross pathology to need a frozen section to help him in diagnosis at the operating table. Since 1915, and especially since 1922, the public has become so enlightened that malignant disease formerly easily recognized either clinically or in the gross, now appears in our operating rooms devoid of its easily recognized clinical and gross appearance and can only be properly discovered by an immediate frozen section. The majority of operating rooms are not equipped or prepared for this new diagnostic test.

The first essential part for this diagnosis is the technician—one to cut and stain the frozen section, or to make and stain the smear. The second is a pathologist trained to interpret it. It is possible for the surgeon to be all three in himself, and some young surgeons are so equipped. In others it is a dual combination—surgeon and pathologist in one, and the technician. More frequently it is three—operator, technician and pathologist. It makes little difference whether it is one, two or three individuals, providing each has the equipment and training for this most difficult diagnostic test.

In the address as chairman of the surgical section of the Southern Medical Association, I discussed biopsy, and this paper has been published in the Southern Medical Journal for January 1927 (Vol. XX, page 18). A reprint of this paper will be sent to anyone on request. The chief object of this letter is to come in contact with surgeons and pathologists who are sufficiently interested in this problem to discuss it either by correspondence, or by attending a meeting in the surgical pathological laboratory of the Johns Hopkins Hospital, either the Monday before or the Friday after the meeting of the American Medical Association in Washington.

Schools for technicians may have to be established in different sections of the country, and the surgical pathological laboratories of the medical schools and the larger surgical clinics should offer courses in this tissue diagnosis, so that surgeons may learn to become their own pathologists, or pathologists learn the particular needs of the surgeon in tissue diagnosis in the operating room.

It is quite true that when the majority of the public are fully enlightened, the surgeon will see lesions of the skin and oral cavity and the majority of subcutaneous tumors when they are so small that their complete excision is not only indicated, but possible without any mutilation. The chief danger here will be a surgical mistake—the incomplete removal of an apparently innocent tumor. There is no necessity here for biopsy. If a proper local excision is done, no matter what the microscope reveals, that local operation should be sufficient. But when lesions of the skin, oral cavity and soft parts are extensive and their complete radical removal mutilating, then there must be biopsy to establish the exact pathology.

In tumors of the breast and disease of bone, for years, the diagnosis could be made clinically, or from the gross appearances at exploration. But now, in an increasing number of cases, the breast tumor must be explored, and the gross pathology of this earlier stage is not sufficiently differentiated to allow a positive diagnosis. Immediate frozen sections are essential to indicate when the complete operation should be done. The same is true of the earlier stages of lesions of bone. The x-rays no longer make a positive differentiation between many of the benign and malignant diseases, for example, sclerosing osteomyelitis and sclerosing osteosarcoma.

We must not only specialize in tissue diagnosis, but we must organize this department so it will function

properly in as many operating rooms as possible in this country.

Then there is a final and most difficult question to consider. I doubt if it can be settled. What shall be done in those operating rooms in which there is no technician to make the sections and no one trained to interpret the microscopic picture? How can a piece be excised or a tumor removed, for example, from the breast, and this tissue sent to some laboratory for diagnosis without incurring the risk of the delay to the patient. I have discussed this point in my paper on biopsy.

JOSEPH COLT BLOODGOOD,  
Surgical Pathological Laboratory,  
Johns Hopkins Hospital.

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## OBITUARY

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### Dr. J. G. Millspaugh

Dr. Joseph Gillispie Millspaugh, a leading physician in Little Falls since 1892, died Jan. 31, 1927, at Monrovia, Calif., where he and Mrs. Millspaugh were spending the winter. He was 76 years old. Death was due to cerebral hemorrhage.

Dr. Millspaugh was a native of Battle Creek, Mich., where he was born on February 19, 1851, the son of Jacob M. and Mary Ann (Dicker) Millspaugh. He was graduated from the Battle Creek high school and from Hope college at Holland, Mich., in 1874, receiving the degree of Bachelor of Arts. Later he attended the medical department of the University of Michigan at Ann Arbor, and was graduated from that institution in 1876. Subsequently, Dr. Millspaugh took a course in medicine and surgery at Columbia university, New York City, and obtained his degree there in 1877.

After passing his medical examination Dr. Millspaugh began the practice of medicine and surgery at Battle Creek, where he remained for six years. In 1879 he was married to Anna M. Zang of Battle Creek. On account of poor health he abandoned his practice at Battle Creek and moved to Park River, N. D., where he practiced for eight years. While in North Dakota he became prominent in the medical profession. From North Dakota he removed to Superior, Wis., and remained there a year. Climatic conditions being unfavorable in the care of one of his children, he moved to Little Falls in 1892 and began the practice of medicine in Morrison county.

During his practice in North Dakota he served as first superintendent of the North Dakota board of health and also as president of the North Dakota State Medical Association. He was one of the instigators of the movement to obtain the passage of an act regulating medical practice in the state of North Dakota. He served as councilor for the Minnesota Medical Society in the second district and was at one time president of the Upper Mississippi Medical Society. He also served as secretary of the local pension board for about 15 years.

Surviving are his widow and two children, Mrs. A. W. Ide of St. Paul and Mark Millspaugh of Ar-

cadia, Calif. Another daughter, Lula B., died early in life.

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### Dr. Alvah J. Stowe

Dr. Alvah J. Stowe, for thirty years a practicing physician in Minnesota, died Friday, Jan. 15, 1926, at his home in Minneapolis. Dr. Stowe had lived in Minneapolis for eight years, but most of his medical life had been spent in Rush City, Minn.

Born in Waterville, Minn., in 1861, he attended Shattuck school at Faribault, and the College of Medicine and Surgery in New York city, taking his medical degree there. In 1877 he moved to Rush City, Minn., where he took up the practice of medicine after graduation. In 1888 he was married to Miss Mina Riddell.

In 1904 Dr. Stowe moved to Minneapolis, where he lived for eight years. His wife died in 1908, and three years later he married Miss Jane Ogden, returning to Rush City the following year. Last summer he was forced to give up practice because of ill health, and returned to Minneapolis.

Dr. Stowe was a member of Jasper lodge, A. F. & A. M., the Masonic Veterans' Association, the Minnesota Medical Association, and the Shrine.

Dr. Stowe is survived by his wife, two sons, Dr. L. R. Stowe of Minneapolis, and Edward of Duluth; two sisters, Mrs. Elizabeth Chittenden and Mrs. Mary Fish of Waterville, and two brothers, George of Coleraine and Herbert of Waterville.

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### Dr. Robert L. Wiseman

Dr. Robert L. Wiseman of Pine City, Minn., died Thursday, Jan. 20, 1927, at St. Joseph's hospital in Saint Paul, following an operation.

Dr. Wiseman was a Minnesotan, born and reared. Born at Stockton in 1874, he moved to St. Paul with his parents when he was a few years old. There he lived until he went to Pine City in 1897. He was a graduate of St. Paul Central high school and of the University of Minnesota school of medicine.

Since 1897 he has practised continuously at Pine City. He was married in 1900 to Miss Louise Davis of St. Paul.

Twenty years ago he was resident physician at Pokegama sanatorium, at Pine City. He was a former mayor of Pine City and at one time served as a member of the city council.

As a tribute to Dr. Wiseman, his fellow townspeople are raising funds to establish a memorial to the country doctor who devoted his life to them and their families.

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### Dr. Ralph E. Morris

Dr. Ralph Edwin Morris, heart specialist, a member of the University of Minnesota faculty since 1913, died Thursday, Jan. 27, 1927, at his home in St. Paul, after a two weeks' illness, of heart disease.

During the war, Dr. Morris served as an instructor of army physicians in cardiosis and aided in the per-

fection of a cardiac machine which automatically traces the heart action.

He was born in Georgetown, Col., in 1879 and was graduated from the University of Colorado Medical College in 1902. He won his Ph.D. at the University of Minnesota in 1913 and immediately became a member of the faculty.

He was a member of the American College of Physicians, American Legion Post. No. 8, and Omega Upsilon Phi medical fraternity.

### Dr. Bertolet P. Rosenberry

Stricken while giving testimony on the witness stand in district court, Dr. B. P. Rosenberry, of Winona, died Wednesday, January 19, 1927, at the age of 45. Death was attributed to heart disease.

Dr. Rosenberry was born in Menominee, Mich. He was a graduate of the University of Minnesota, and practiced for eight years in Arcadia, Wis., before coming to Winona. During the World war he was a major in the medical corps of the American Expeditionary forces. His widow and a 13-year-old daughter survive.

## OF GENERAL INTEREST

Dr. Josephine Tofte, formerly of Crookston, Minn., is now practicing in Dawson, Minn.

Dr. Egbert Borgeson, formerly of the Mayo Clinic, Rochester, is now located in Saint Paul.

Dr. Henry Roust, who located in Fairmont six months ago, has left, intending to locate elsewhere in the state.

Dr. E. W. Humphrey of Moorhead was recently re-elected president of the Clay County Public Health Association.

Dr. Harold J. Prendergast of Saint Paul has been appointed civil service medical examiner for the city of Saint Paul.

Dr. P. C. Engelhart has moved from his former location at Wood Lake, Minn., and is now practicing in Minneapolis.

The 1927 convention and exposition of the American Hospital Association will be held in Minneapolis. The exact dates have not been announced.

The engagement of Dr. C. W. Mayo, son of Dr. and Mrs. Charles H. Mayo of Rochester, to Miss Alyse Varney Plank of Collingdale, Pa., has been announced.

The Minnesota state hospital for crippled children at Phalen Park, Saint Paul, Minn., recently received a bequest of \$5,000 from the estate of Mrs. Alice F. Bigelow of Saint Paul.

Dr. Henri Fredericq, of Liege, Belgium, gave a Mayo Foundation lecture in Rochester on the evening of February 1. His subject was "Humoral transmission of nervous action."

Dr. Walter J. Marckley of Minneapolis has been named head of the tuberculosis department of the new United States Veterans' bureau hospital at Fort Snelling, which will open April 9.

The marriage of Dr. Reuben M. Anderson, Morristown, Minn., to Miss Mildred M. Peterson of Saint Paul, took place in November, 1926. Dr. and Mrs. Anderson are now at home in Morristown.

Dr. Frank E. Burch of Saint Paul has been appointed chief of the Department of Ophthalmology and Otolaryngology at the University of Minnesota medical school, to succeed the late Dr. W. R. Murray.

Dr. J. W. Kernohan has returned to the Mayo Clinic after a vacation spent at his home in northern Ireland. While he was abroad he visited pathologic clinics in Italy, Germany, Switzerland, Holland, and the British Isles.

Dr. Henry C. Cowles, of the University of Chicago, gave a lecture, under the auspices of The Mayo Foundation and the local chapter of Sigma Xi, in Rochester, on the evening of February 3. His subject was "Plant ecology in human affairs."

Dr. Kano Ikeda, formerly of the Minneapolis General Hospital, has been appointed director of laboratories at St. Luke's Hospital in Saint Paul. Dr. Ikeda has been director of the laboratories of the Minneapolis General Hospital for the past seven years.

Announcement has been made of the marriage of Miss Mona Munro of Arlington, Mass., to Dr. Claude J. Ehrenberg, Minneapolis, which took place in Minneapolis, Thursday, February 10, 1927. Dr. and Mrs. Ehrenberg are now at home at 5228 Humboldt Avenue South, Minneapolis.

Erection within a year of a 100 bed convalescent home addition to the Twin City Shriners' Hospital for Crippled Children is being planned. The Twin City Shriners' hospital will be the first of the nine throughout the country to have a convalescent home, although Philadelphia and Saint Louis are making plans for similar buildings.

Dr. George O. Welch, of Fergus Falls, sailed February 7, for Spain, to make a general tour of Europe. Dr. Welch will remain abroad for an indefinite period and will then return to make his home at Fergus Falls, where he has been superintendent of the Fergus Falls State Insane Hospital for the past thirty-four years. Dr. Welch resigned as head of the hospital in January.

Dr. William Engelbach of St. Louis, well known authority on Endocrinology will deliver a lecture Tuesday evening, March 8, at 8 o'clock, in the Palm Room of the Saint Paul Hotel, Saint Paul. The Saint Paul District Dental Society, under whose auspices Dr. Engelbach will lecture, has extended a most cordial



invitation to members of the State Medical Association to attend.

### JOINT SOCIETY MEETING

During the first two weeks of April, 1927, Dr. Allen K. Krause, Director of Tuberculosis Laboratories and Tuberculosis Dispensary, Johns Hopkins Hospital, Editor of American Review of Tuberculosis, Associate Professor of Medicine, Johns Hopkins Hospital, and active or honorary member of numerous medical, scientific and tuberculosis associations and societies throughout the world, will visit the Twin Cities and other points in the State of Minnesota and the University of Minnesota.

Dr. Krause enjoys a national reputation as an expert in tuberculosis in general and as a leading exponent of the tuberculosis problem in childhood. The reputation of such a man is too well known to need elaboration.

Arrangements are being perfected to hold on the night of Monday, April 4, in Minneapolis, the annual banquet of the Lymanhurst Medical Staff with the regular scientific monthly meeting of the staff in conjunction with the regular monthly meeting of the Hennepin County Medical Society and the quarterly meeting of the Minnesota Trudeau Medical Society, The Minnesota State Public Health Association and the Hennepin County Tuberculosis Association.

Immediately following the banquet the usual business of the Societies holding their regular meeting will be dispensed with and after a few remarks from the President or the Representative of each organization, the principal address of the evening will be delivered by Dr. Krause.

The place and hour of the banquet have not yet been determined. It is expected that this banquet will be the outstanding medical gathering of the year in Minneapolis, and will be well attended by the profession of the Twin Cities and from points throughout the state; the medical society auxiliaries; the numerous public health and social organizations, and is open to the interested laymen.

**Gynergen—Ergotamine Tartrate.**—The normal tartrate of the principal alkaloid of ergot. Gynergen stimulates the motor nerve endings of the sympathetic division of the autonomic nervous system, thus causing an increase in blood pressure, contraction of the uterus, etc. It is proposed for use when the action of ergot to produce uterine contractions is desired. It is contraindicated when a tonic contraction of the uterus is undesirable. Gynergen is administered intramuscularly or hypodermically, and orally. The product is supplied in the form of Ampules Gynergen, 1.1 c.c., and Tablets Gynergen, 0.001 Gm. H. A. Metz Laboratories, Inc., New York.

**Ampoules Glucose (Dextrose-U. S. P.) Lilly 25 Gm., 50 c.c.**—Each ampule contains Dextrose-U. S. P., 25 Gm., distilled water to make 50 c.c., accompanied by an ampule containing 2 c.c. of a buffer solution. Eli Lilly & Co., Indianapolis. (Jour. A. M. A. Jan. 8, 1927, p. 101.)

## REPORTS AND ANNOUNCEMENTS OF SOCIETIES

### THE MINNEAPOLIS SURGICAL SOCIETY

The regular monthly meeting of the Minneapolis Surgical Society will be held Thursday, March 3rd, at 8:00 P. M., in the library of the Hennepin County Medical Society, Donaldson Bldg., Minneapolis. The following program will be presented:

1. Case reports.
2. Surgery in Gastric Ulcer—Dr. Verne Cabot.
3. The Injection Treatment of Varicose Veins by the Use of Sclerosing Solutions—Dr. H. O. McPheeters.

### NORTHWEST CONFERENCE ON CHILD HEALTH AND PARENT EDUCATION

A further example of the interest which is being taken in the health and education of the child by the laity and the medical profession in the Northwest Conference on Child Health and Parent Education which is to be held in Minneapolis, March 8, 9, and 10. Physicians as well as parents need to keep up with the work along these lines being done by those who are devoting their activity to the study of child life. The large number of organizations which are sponsoring this particular conference is indicative of its wide scope. Physicians are urged to take advantage of the meetings, the tentative program of which follows:

#### PROGRAM

**General Session, Tuesday Morning, March 8**  
9:15-12:00

#### THE DEVELOPMENT OF THE CHILD

**Chairman:** MRS. FRANK A. CHAMBERLAIN, *Minneapolis*  
**Invocation:** THE REVEREND DR. JOHN E. BUSHNELL,  
*Westminster Presbyterian Church, Minneapolis*

1. The Characteristics of the Healthy Child.  
HENRY F. HELMHOLZ, B.S., M.D., *Professor of Pediatrics, Mayo Foundation for Medical Education and Research*
2. The Normal Growth of the Child.  
RICHARD E. SCAMMON, Ph.D., *Professor of Anatomy, University of Minnesota*
3. Posture in Relation to Growth and Development.  
ARMIN KLEIN, M.D., *Director, Posture Clinics, Massachusetts General Hospital, Boston*

#### Luncheon Round Table Conferences

12:15-2:00

1. The Development of the Child.  
**Chairman:** F. W. SCHLUTZ, B.A., M.D., *Chief of the Department of Pediatrics, University of Minnesota*.  
Discussion of Addresses of the Tuesday morning session, by:  
DR. O. W. ROWE, *Duluth*  
DR. N. O. PEARCE, *University of Minnesota*  
DR. FREDERICK C. RODDA, *University of Minnesota*  
DR. W. RAY SHANNON, *University of Minnesota, and others*
2. The Nutrition of the Child.  
**Chairman:** EDGAR J. HUENEKENS, B.A., M.D.  
Some Problems of Child Nutrition.  
LYDIA J. ROBERTS, S.M., *Assistant Professor of Home Economics, University of Chicago*

## Discussion by:

DR. WOODARD L. COLBY, *University of Minnesota*  
DR. ALBERT M. BRANDT, *Bismarck, N. D., and others*

**General Session, Tuesday Afternoon, March 8**  
2:30-4:30

*Chairman:* MRS. JOHN E. PRIEDEMAN, *St. Paul*

1. Work and Efficiency in School Children.

MAX SEHAM, M.D., *University of Minnesota*

2. The Constitutional Make-Up of the Child.

GEORGE DRAPER, M.D., *Columbia University*

3. The Health Habits of the Child.

ARTHUR B. CHANDLER, M.D., *Medical Director, Nursery School Laboratory, McGill University, Montreal*

**General Session, Tuesday Evening, March 8**  
8:00

MR. WILLIS K. NASH, *President of the Conference, Introducing, as Presiding Officer, THE HONORABLE EDWARD F. WAITE, Judge of the District Court, Hennepin County, Minnesota*

*Address:* The Parent and the School.

MRS. A. H. REEVE, *President, National Congress of Parent-Teacher Associations*

*Address:* Community Provision for a Child Health Program.

GRACE ABBOTT, *Chief, Children's Bureau, U. S. Department of Labor, Washington, D. C.*

**General Session, Wednesday Morning, March 9**  
9:15-12:00

**THE CHILD AT HOME**

*Chairman:* MRS. JOHN S. PILLSBURY, *Minneapolis*

*Invocation:* THE RIGHT REVEREND JAMES P. CLEARY, *Church of the Incarnation, Minneapolis*

1. What the Mother May Learn Through Directed Observation of the Child.

LOVISA C. WAGONER, Ph.D., *Professor of Child Study, Iowa State College*

2. Early Training and the Development of the Individual. JOHN E. ANDERSON, Ph.D., *Director, Institute of Child Welfare, University of Minnesota*

3. The Young Child and Its Parent.

BIRD T. BALDWIN, Ph.D., *Director, Child Welfare Research Station, University of Iowa*

**Luncheon Round Table Conferences**  
12:15-2:00

1. Study Groups.

*Chairman:* MRS. A. A. MENDENHALL, *President, Minnesota Congress of Parent-Teacher Associations*

*The Value of Study Groups for Parents.*

EDITH D. DIXON, B.S., *Assistant Professor and Extension Specialist, Institute of Child Welfare, University of Minnesota*

*Discussion by:*

MRS. ABBOTT FLETCHER, *Minneapolis College Women's Club*

MRS. THEODORE C. BLEGEN, *Minnesota Congress of Parent-Teacher Associations*

2. Social Hygiene.

*Chairman:* MRS. ROBBINS GILMAN, *Executive Secretary, Women's Co-operative Alliance, Minneapolis*  
*Sex Education and the Young Child.*

MRS. SIDONIE M. GRUENBERG, *Director of the Child Study Association of America, New York*

*Discussion by:*

MISS ALICE P. LEAHY, *Minneapolis Child Guidance Clinic, and Others*

**General Session, Wednesday Afternoon, March 9**  
2:30-4:30

*Chairman:* MRS. DAVID PERCY JONES, *Minneapolis*

1. Problems of Childhood.

2. Discipline in the Home.

SMILEY BLANTON, M.D., *Director, Minneapolis Child Guidance Clinic, Professor-Elect of Child Study, Vassar College*

3. The Adolescent Age

BORDEN S. VEEDER, M.D., *Washington University, St. Louis*

**Evening Session, Wednesday, March 9**  
6:30

**Banquet—Curtis Hotel**

MR. WILLIS K. NASH, *President of the Conference, Introducing as Presiding Officer LOTUS DELTA COFFMAN, Ph.D., LL.D., President, University of Minnesota*

*Introductory Address:* The Parent and the University. LOTUS DELTA COFFMAN, Ph.D., LL.D.

*Address:* Parental Responsibility for Child Development.

**General Session, Thursday Morning, March 10**  
9:15-12:00

**THE CHILD IN THE COMMUNITY**

*Chairman:* DR. JAMES T. CHRISTISON, *St. Paul*

*Invocation:* RABBI ALBERT G. MINDA, *Temple Israel, Minneapolis*

1. The Law and the Child.

WILLIAM HOBSON, B.A., LL.B., *New York Council of Social Agencies*

2. Social Influences in the Life of the Child.

DR. FREDERICK M. ELIOT, *St. Paul*

3. The Community's Needs in the Health Service of the Child.

SAMUEL J. CRUMBINE, M.D., *General Secretary, American Child Health Association, New York*

**Luncheon Round Table Conferences**  
12:15-2:00

1. Education for the Super-Normal.

*Chairman:* MR. W. F. WEBSTER, *Superintendent of Minneapolis Public Schools*

*The Exceptional Child.*

MELVIN E. HAGGERTY, Ph.D., *Dean of the College of Education, University of Minnesota*

*Discussion by:*

L. J. BRUECKNER, Ph.D., *Associate Professor of Education, University of Minnesota*

2. The Handicapped Child.

*Chairman:* M. L. STIFFLER, M.D., *Director, St. Paul Child Guidance Clinic*

*Physical Handicaps.*

BORDEN S. VEEDER, M.D., *Washington University, St. Louis*

*Mental Handicaps.*

MRS. SMILEY BLANTON, *Minneapolis*

Discussion by:

MISS MAE BRYNE, *Minneapolis*  
 DR. JAMES T. CHRISTISON, *University of Minnesota*  
 DR. ROY ANDREWS, *Mankato*  
 DR. EDWARD D. ANDERSON, *University of Minnesota*

General Session, Thursday Afternoon, March 10  
 2:30-4:30

**THE CHILD IN SCHOOL**

Chairman: MRS. RUTH HAYNES CARPENTER, *Minneapolis*

1. Mental Hygiene in Schools and Colleges.  
 ARTHUR H. RUGGLES, M.D., *Director of Butler Hospital, Providence, Rhode Island*
2. What the Elementary School Can Do in Character Education.  
 GEORGINA LOMMEN, M.A., M.L., *Director of Teaching, State Teachers' College, Moorhead, Minnesota*
3. The Relation of the Home to the School in the Care and Training of Children, from the Third Year on Through the 'Teens.  
 M. V. O'SHEA, Ph.D., *Professor of Education, University of Wisconsin*

**ORGANIZATIONS SPONSORING THE CONFERENCE**

University of Minnesota  
 Minnesota State Federation of Women's Clubs  
 Minnesota League of Women Voters  
 Minnesota Congress of Parents and Teachers  
 Minnesota State Public Health Association  
 Division of Child Hygiene—State Department of Health  
 Children's Bureau, State Board of Control  
 Institute of Child Welfare—University of Minnesota  
 Minnesota State Hospital Association  
 Minnesota State Registered Nurses' Association  
 Fifth District Minnesota State Federation of Women's Clubs  
 Hennepin County Public Health Association  
 Hennepin County Medical Society  
 Ramsey County Medical Society  
 Hennepin County Tuberculosis Commission  
 Hennepin County Tuberculosis Association  
 Hennepin County Child Welfare Board  
 Minneapolis District Dental Society  
 Third District Minnesota Registered Nurses' Association  
 Minneapolis Civic and Commerce Association  
 St. Paul Association  
 Minneapolis Council of Churches  
 Minneapolis Council of Social Agencies  
 Minneapolis Division of Health  
 Infant Welfare Society  
 Visiting Nurses' Association  
 Women's Co-Operative Alliance  
 Women's Community Council  
 Council of Jewish Women  
 Minneapolis League of Catholic Women  
 Family Welfare Association  
 Woman's Welfare League  
 Children's Protective Society  
 St. Paul Baby Welfare Association  
 Minneapolis Parents' and Teachers' Association

St. Paul Council of Parents and Teachers  
 Minneapolis Parochial Parents' and Teachers' Association  
 Minneapolis Class-Room Teachers' Association  
 Minneapolis Teachers' League  
 College Women's Club  
 Junior League  
 Minneapolis Child Guidance Clinic  
 St. Paul Child Guidance Clinic  
 Minneapolis Rotary Club  
 Minneapolis Lions Club  
 Minneapolis Kiwanis Club  
 Minnesota Association for Crippled Children  
 Rosedale Cottage Association  
 Norwegian Lutheran Church of America

**TICKETS**

Course tickets \$3.00, admitting holder to all general sessions of the conference.

Single session tickets, \$0.50.

Luncheon tickets, daily Round Tables, \$0.75.

Dinner ticket, Wednesday, March 9th, \$1.50.

Tickets and reservation may be made by addressing the Secretary of the Conference, 625 Sexton Building, Minneapolis.

**PROCEEDINGS OF THE MINNESOTA ACADEMY OF MEDICINE**

Meeting of December 8, 1926.

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, December 8, 1926, at 8 p. m. Dinner was served at 7 p. m.

The meeting was called to order by the Vice-President, Dr. John E. Hynes. There were 21 members and 1 visitor present.

Dr. John E. Hynes read the report of the Committee appointed to draw up resolutions on the death of Dr. Baldwin, an Honorary Member of the Academy: "LOUIS BENEDICT BALDWIN, born Oct. 27, 1872, died Oct. 24, 1926. Graduate of the University of Minnesota Medical School 1897. An Honorary Member of the Academy of Medicine since 1911. He served his internship at the City and County Hospital, St. Paul, 1897-98. Practiced medicine in Cando, N. D., for two years and became Assistant Superintendent of the Hospital for the Insane at Jamestown, N. D.

"From this time until his untimely death he was engaged in the problems of hospital administration. In 1910 he was elected Superintendent of the University Hospital and held this position until his death; also serving as Superintendent of the Miller Hospital for two years.

"During the late War Dr. Baldwin was stationed in the Surgeon General's Office, first as Captain and later as Lieutenant Colonel.

"It is particularly to be regretted that Dr. Baldwin had to leave on his pilgrimage in these rather trying hours for the Medical Profession, as he stood always on the side of right and was fearless and outspoken in condemning chicanery and intrigue whether within

or without the medical fraternity. Our profession has much need of such indeed.

"To those who knew him best, his rather brusque manner was nothing but a cloak to hide an inner sensitiveness, and he was essentially social—an apostle of the theory that man is born to live a life in the fellowship of man—and the genuine regret and grief which was manifested when his many friends heard that Mr. Steadfast-for-Truth had been served with a summons was evidence of the respect and high esteem in which he was held.

"No finer example of beautiful, devoted, sustaining helpfulness was ever witnessed than that of his wife during the days of his impaired health."

The Committee:

JOHN E. HYNES, Chairman,  
W. A. JONES,  
J. T. CHRISTISON.

The scientific program of the evening consisted of the following case reports.

DR. A. R. COLVIN (St. Paul) reported a case of large osteoma of the pelvis removed by operation. (Specimen shown.)

The patient from whom this bone tumor was removed was 46 years of age, married, and the mother of twelve children.

The tumor was first noticed fifteen years before its removal; it had caused comparatively little trouble even during pregnancy. Lately, however, because of its prominent position it was subject to trauma and the skin over it became ulcerated, and she begged to have it removed, saying that she had been unable to get any one to consent to operate upon it. I also refused, but on her insistence finally consented.

The tumor, slightly larger than an adult head, had its origin from the crest of the ilium.

Because of the nature of the numerous embryological developments taking place in the pelvic region, tumors of the pelvis are of a very varied character, apart from these congenital anomalies and tumors. Neoplasms of various kinds are of course common, particularly those of mesoblastic origin. The presence of many points of ossification lends an opportunity for wandering cartilaginous elements. Osteomata are quite common. This particular tumor seems to be a pure osteoma, having structure corresponding to spongy bone. Whether it belongs to the type of cartilaginous exostosis, I cannot say, except that it seemed rather to grow into the bone than out from it. The crest of the tumor corresponded to the crest of the ilium. Exostoses cartilagines as represented by the lantern slides usually have a pedicle, although they may be sessile, and are usually capped with cartilage and stop growing when ossification of the center—to which they are related—becomes complete. If situated where muscles play over them, they usually have a bursa over their summit. This bursa may undergo all of the changes seen in the bursæ generally. Inflammatory changes usually require the removal of the exostosis with the bursa.

The nature of the base of the exostosis or osteoma is an indication as to the ease or difficulty of removal.

In this case the base represented the ilium just above the acetabulum. Because of the overhanging position of the tumor, it could only be approached from behind, and then in the dark. By separating the fibres of the gluteus maximus up to the crest, a chisel could be driven down to the base and then, turning it forward, driven by a sense of touch through to the anterior aspect of the bone, and the tumor could then be broken off. A dissection of the gluteal and abdominal muscles was then made; that is, they were shelled off the tumor externally and internally, and when this was done the peritoneum was exposed to view although not opened. The two sets of muscles, gluteal and abdominal, were then sutured together and the large wound closed, healing taking place without infection.

The patient was able to do her work as a housewife later, and seemed to suffer very little disability because of the loss of her muscular attachments.

DR. A. E. BENJAMIN (Minneapolis) reported two cases:

*Case 1.*—Multilocular Pseudomucinous Cystadenoma of the Ovary and Associated Dermoid Cyst of the Ovary.

M. B., female, married, age 48. Her chief complaints were: enlargement of the abdomen with discomfort and pressure; pain under the left costal margin which radiates to the back only at times; palpitation; frequency and difficulty in holding urine; slightly nervous.

Her menses began at the age of 13, periods regular, duration 3 to 5 days, no dysmenorrhea. She has two children, aged 12 and 13. Normal deliveries, no miscarriages. Her past history is virtually negative. The patient was examined a year ago by another physician and there was no sign of the present trouble. She was again examined in August and September and fairly large cysts, possibly fibroids, were found. The abdomen is tense, fairly symmetrical, enlarged and very prominent. Dullness extends 3.5 inches above the umbilicus and down to the pubes, filling the whole lower abdomen. The uterus is small, about normal in size, freely movable and the mass is separated from it. There is little or no fluctuation of the mass.

X-ray plates show a very large globular mass occupying practically the entire left four-fifths of the abdominal cavity. The mass appears to arise from the pelvis. It is of uniform density throughout, suggesting that it contains fluid material. Colon injection with barium shows definite stasis in the sigmoid, where there appeared to be moderate compression. The transverse colon is pushed upward by the mass, which also overlaps the descending colon anteriorly to it.

Conclusions: Abdominal mass, probably ovarian cyst.

Operative findings: A double cyst on the right side, one containing 1½ gallons of thick gelatinous substance similar to that in dermoid cysts. This cyst was one foot in diameter. The other cyst was about one-fourth as large, adherent to the appendix. There was one cyst on the left containing about 12 ounces of similar fluid and involving two-thirds of the left ovary. This cyst was adherent to the bladder. The appendix was short, club-shaped, and congested. The gallbladder was practically normal. At operation (11-8-26) the



cysts were removed, also the greater part of the ovaries and about three-fourths of the tubes. The appendix was also removed. The patient made a good recovery.

There is a very good description of such cysts in Hertzler's Treatise on Tumors.

**Microscopic Appearance:** Lined with columnar epithelium, with the nuclei lying near their base. Degeneration and exfoliation found in the cyst contents. The cyst wall showed a layer of loose connective tissue with large vessels, and external to this a layer of dense fibrous tissue with few nuclei. Also a layer of flattened epithelial cells. Papillary projections within the cyst—epithelial prolongations and proliferations of the fibrous tissue of the cyst wall.

**Case 2.**—A Case of Post-operative Abdominal Adhesions, Cholecystitis, Cholelithiasis, with persistent hiccough.

C. O. O., age 44, male, married 14 years, Swedish, hotel clerk.

**Diagnosis:** Post-operative abdominal adhesions; cholecystitis, cholelithiasis, persistent hiccough.

**Chief complaints:** gastric distress, belching, pyrosis, constipation, nervousness, fatigue.

As a child he had had measles. Had been vaccinated.

**Operations:** Appendectomy in 1906, abdominal adhesions in 1915, repair of post-operative hernia in 1920, complete repair of hernia in 1921, tonsillectomy in 1923, and repair of post-operative abdominal hernia in 1926.

The patient had sinusitis. The heart was somewhat enlarged, and there was palpitation and dyspnea. The patient has some gastric disturbance, gas pains, pyrosis, and eructation; is constipated; and has to be careful of food. The skin is sallow. Blood pressure 110/80. The abdomen shows tenderness over the right costal margin, some rigidity, several scars.

X-ray plates of the chest show the heart and lungs negative. Plates of the gallbladder before and after Cole-Graham dye show one definite round calculus shadow in the region of the gallbladder; definite evidence of pathological gallbladder with at least one stone. Plates of the nasal accessory sinus show a round dim shadow in the lower part of the left maxillary sinus. The remaining sinuses are clear. Conclusions from sinus plates are that there is localized involvement at the lower part of the left maxillary sinus—mucocoele. The lower jaw is normal.

Laboratory examination: urine normal; hemoglobin 90; Wassermann negative.

**Operative findings:** post-operative hernia, intestinal adhesions, loop of small intestine adherent to the abdominal wall, also omental adhesions.

**Second operation—Cholecystectomy.** Loops of small intestine were kinked and adherent near the upper and central line. The omentum was adherent to the duodenum and to the gallbladder. There were bands of adhesions extending from the gastric hepatic omentum to a loop of small intestine over the stomach. The gallbladder was small, and very adherent to the surrounding structure. A stone  $\frac{3}{4}$  of an inch in diameter was found way down in the end of the cystic duct. A few small stones were in the duct. One stone was ulcerating through the wall of the fundus.

The course after the first operation was negative except for fever due to sinusitis or gallstones and cholecystitis.

Course in the second operation is persistent hiccough. Hiccoughing stops for short intervals under sedatives but returns. There is some vomiting and bloody serum from irritation. Nearly all known remedies have been tried to stop the hiccoughing but with little or no results. Drain (Penrose) still present attached with plain catgut, to the stump not yet absorbed. Temperature 99 to 100. Pulse 80 to 95.

DR. WALLACE COLE (St. Paul) reported cases and showed numerous lantern slides of operations in cases of paralytic feet.

DR. E. M. JONES (St. Paul) reported cases of phrenicotomy for pulmonary tuberculosis. X-ray films were shown.

#### DISCUSSION

DR. JONES: Undoubtedly there is a field for this type of work, particularly in cases where there is a lower lobe lesion. It can be done without any particular difficulty.

DR. ULRICH: I am glad Dr. Jones brought up this question of phrenicotomy. I think it is the right direction we are taking in surgery of the lung. I heard Dr. Yates talk about this some time ago. Tuberculosis of the lower lobe is a very uncommon condition. He mentioned conditions in the lower lobe which may be very well treated along these lines. He also brings out that phrenicotomy does not put at rest the lung tissue. He claims that there is improvement in the circulation and thereby he gets healing. That is his argument for changes in intrathoracic pressure. In the last case Dr. Jones showed, I think the reason there was no displacement of the mediastinum was because it was fixed. If you have a fixed mediastinum, your phrenicotomy will not push the heart over.

We used to think that bilateral paralysis was a lethal condition. That has been shown to be not so by double phrenicotomy. Recently Lemon has produced double phrenicotomy in dogs and he defies any one to pick out phrenicotomized dogs from the non-phrenicotomized dogs by their activities.

DR. J. T. CHRISTISON (St. Paul) reported a case of Actinomycosis of the Lungs and Adrenal.

The patient, A. J., a boy 8 years of age, was admitted to the Miller Hospital on September 20, 1926, complaining of cough, fever and rapid respiration. At the age of three months he had bronchitis; at the age of eight months he had a cough with pneumonia; and at the age of five years he had pneumonia with a cough, and has never been well since. In July 1925 Dr. Geer sent him to the preventorium because of weakness and anemia, but he did not improve there as he should have. On September 17, 1926, an abscess on his back was opened and shortly after that a diagnosis of pneumonia was made and he was sent in to the Miller Hospital. There the physical examination showed rapid and somewhat labored breathing, with diminished expansion on the right side. On the left side there were

coarse breath sounds but no dullness, but on the right side there was dullness below the level of the 6th rib, and bronchophony at the right base. For a time the lung condition seemed to begin to clear up but it again grew worse and he grew gradually weaker until death on November 17, 1926.

The urine was negative; the sputum was large in amount but no tubercle bacilli were seen. The hemoglobin was 45 per cent, the red count 3,100,000, the white count 15,500, and the differential was 66 per cent polymorphonuclears, 32 per cent lymphocytes, and 1 per cent eosinophiles, on October 2, 1926.

The X-ray diagnosis on October 4, 1926, was "bronchopneumonia and pleurisy," but on October 25th it was "advanced tuberculosis."

The temperature was very irregular and varied from 99° to 104°. The pulse was also irregular and varied from 120° to 170°.

**Pathological Report:** The body is that of a poorly-developed and emaciated male child with a length of 124 cm. There is no rigor, lividity, edema, cyanosis, or jaundice. On the back just to the right of the spine and just above the top of the sacrum is a small opening in the skin covered with a brown crust. When the crust is removed no pus is visible and a probe extends only into the subcutaneous tissue with no communication with any cavity or pus pocket.

The anterior abdominal wall is very thin with practically no subcutaneous adipose tissue. The muscles are pale and flabby. In the peritoneal cavity are no fluid or adhesions, but under and behind the liver is a thick layer of yellowish-white fibrin. The appendix is unusually large but hangs free and shows nothing of interest.

Both pleural cavities are entirely obliterated by firm, fibrous adhesions which are broken with difficulty. No fluid is seen.

The pericardial cavity shows only a few drops of clear yellow fluid.

The heart weighs 120 gms. The muscle is pale in color and flabby in consistency. Gross sections show the walls of both ventricles to be thinned and the chambers to be dilated and unusually large. The valves and endocardium are smooth and shining and show nothing of interest. The coronaries are patent and present smooth inner surfaces. The root of the aorta is smooth and shining.

The right lung weighs 315 gms. and the left 400 gms. Both are very large and show over the external surface many small nodules measuring about 3 mm. in diameter. Gross section shows the main substance of the lung to be soft and feathery in consistency and scattered throughout it are small areas which measure 3 to 5 mm. in diameter. Many of these are firm and white, but the greater number are filled with soft, thick, greenish pus and when this is removed there remains a tiny smooth-walled cavity. No definite caseous areas are seen. The lymph nodes along the hilus are enlarged to a moderate degree and dark in color but they show no evidence of either caseation or calcification.

The spleen weighs 100 gms. The capsule is tense and dark red. Gross section shows the pulp to be firm in consistency and dark red in color.

The liver weighs 780 gms. The upper surface is bound to the diaphragm by a thick layer of yellowish-white fibrin which is easily broken with the fingers. This extends over the top of the organ and underneath down toward the adrenal. The gallbladder is much enlarged and a dead white in color. Gross section shows the wall to be greatly thickened, pure white and translucent. From the cut surface clear fluid exudes. The inner surface shows nothing different. The lumen is filled with clear, yellow bile. Gross section of the liver itself shows it is to be pale in color with prominent red mottlings characteristic of a chronic passive congestion.

The gastro-intestinal tract appears to be normal throughout. The pancreas shows nothing of interest.

The left adrenal shows nothing of interest and is normal in shape and size. The right adrenal weighs 50 gms. It is enlarged to a marked degree and fluctuates upon palpation. Gross section shows the organ to be greatly enlarged by pockets of greenish-yellow pus throughout. The yellow tissue of the adrenal is present in thick trabeculae between the pockets of pus, and the entire organ is limited by a thick, fibrous capsule. No connection can be seen between this organ and the abscess of the back.

The kidneys each weigh 80 gms. The capsules strip readily, leaving smooth, shining surfaces. Gross section shows the markings to be distinct and the pelvis and ureters normal in appearance. The bladder and genital organs appear entirely normal.

The aorta is smooth and shining throughout.

Enlarged lymph nodes are found at the bifurcation of the trachea and along the bronchial tree, but all of these are dark in color and homogeneous, with no evidence of either caseation or calcification. Slightly enlarged nodes are also found in the mesentery, but these are pink and show nothing of interest.

Culture of the heart's blood is negative.

**Diagnoses:** 1. Organized pneumonia of lung.

2. Actinomycosis of lung.

3. Actinomycosis of adrenal.

4. Localized fibrinous peritonitis.

5. Healed chronic pleuritis (bilateral).

6. Cardiac dilatation.

7. Acute cholecystitis.

8. Emaciation.

**Microscopic sections show:**

**Lungs:** Many of the alveoli are empty and normal in appearance. Many are filled with new-formed connective tissue which is evidently replacing the exudate in them. In other areas the alveoli are filled with pus cells but in yet other areas there are accumulations of pus cells which have replaced the alveolar walls and represent abscesses and in the center of some of these are distinct and typical ray fungi.

**Adrenal:** This shows large masses of pus cells in some areas and in other areas there is extensive necrosis. Between these areas there are divisions or septa of connective tissue and in the centers of some of the pus cells are typical ray fungi.

The heart, pancreas, and spleen show nothing of interest.

**Liver:** The liver shows an atrophy of the cords

around the central vein and in the centers of these is a prominent deposit of brown pigment. At the periphery of the lobules there is a marked fatty change of the cords.

Gallbladder: This shows a wall which is thickened to a very marked degree. This thickening is evidently caused by an edema, but scattered throughout—especially near the mucosa—are many lymphocytes and pus cells.

#### DISCUSSION

DR. SCHLUTZ: This is certainly a very rare case. Parasitic diseases are particularly rare in our section of the country. They are about the last thing many of us think of. I don't know what the experience is farther south, where, I believe, they have a good many more cases than we have here. The x-ray plates remind me somewhat of plates I saw in Montevideo, South America. They have a great prevalence of hydatid cysts in that country. In the early stages of the disease they show some very puzzling x-ray pictures which would make many of us think of tuberculosis, but the men down there, being familiar with conditions, will spot them very readily. They turn out to be hydatid cysts. At the time I was there, Dr. Morquio had an unusually large number of children who showed this disease in the chest in various stages. The cyst generally breaks into a bronchus and the child recovers. The condition affects the head and lungs, and less often the liver. The brain cases are usually fatal, although a few have been reported as recovered. They think of hydatid cyst almost as the first thing, just as we think of tuberculosis first, due to the fact that they have so much of it. Sheep carry the parasite and the shepherd dogs give it to the children.

Actinomyces is a rare condition, I believe, in this part of the United States. Personally I have never seen a case.

DR. ULRICH: I had the pleasure of seeing these lungs at the Pathological Conference and it is an extremely rare thing to have actinomyces of the lung. Actinomyces in cattle is a rather benign affair. In our medical cases we find actinomyces is usually around the cecum and then in various parts of the body. To have it just in the lung is an extremely rare condition. Visceral actinomyces is always fatal in human beings.

DR. ZIMMERMANN: I do not believe that actinomyces is as rare as we are taught. Neither do I believe that local actinomyces is necessarily very fatal. I have taken care of four cases of local actinomyces in the past two years. Two were in the tongue, one with quite a large abscess at the base of the tongue, reaching down as far as the hyoid bone. Another was in the floor of the mouth, and the fourth was on the right side of the neck. This last one was quite a large, indurated mass covering an area of about 5 cms. transversely and 3 cms. perpendicularly. All of these people got well with even less trouble than with an ordinary local, suppurating infection. In no case was there any extensive excision; merely an incision so made that the exit was bigger than the bottom of the abscess, and the wound packed with gauze soaked in tincture of iodine solution. Although these cases were

recognized as actinomyces, and treated with iodine, and iodides given internally, it is not inconceivable to me that there must be a good many such cases not recognized, treated with simple incision and drainage, that get well.

DR. CHRISTISON: I have not had time to go through the literature, but a cursory examination does not show very much on actinomyces of the lung in children. I am going to use this as a basis for future enlightenment on the subject.

DR. H. B. ZIMMERMANN (St. Paul) reported a case, and showed specimen, of carcinoma of the stomach in a woman who for three years had given a typical ulcer history.

#### DISCUSSION

DR. HAMILTON: Was this a conjunction of two pathologic processes?

DR. HYNES: Had there been any loss of weight in the last few months?

DR. ZIMMERMANN: It seems inconceivable that the carcinomatous element of this lesion could have existed for a period as long as three years, it was such a small lesion. Whereas, the ulcer history in this woman extended back for a period longer than three years. It is a fact that the woman had lost weight but I may say that this was because she was afraid to eat and had almost starved herself to obviate pain.

DR. H. L. ULRICH (Minneapolis) reported a case of Carcinoma of the Stomach (and showed specimen) which could not be diagnosed during life.

This case is a direct antithesis to Dr. Zimmermann's case. His was a rapidly growing, very obvious tumor (cancer) of the stomach. Mine is a rapidly invasive, but microscopic primary tumor of the stomach.

Mr. C. H., age 37. Admitted to hospital April 4, and died April 27, 1926.

- Complaint: 1. Pain in lower thorax on both sides.  
2. Pain in epigastrium after eating.  
3. Pain in lumbar region.  
4. Polyuria.  
5. Sprained ankle.

There was no family history of tuberculosis or cancer.

The patient had "flu" in 1917; an appendectomy in 1918. He was married; three children living and well. On December 26, 1925, the patient sprained his ankle, remaining in bed three weeks (ankle still swollen when he got up). On February 6, 1926, he reported to the dispensary, complaining of fullness and pressure in chest with sharp shooting pains on both sides. He had a gnawing sensation in the stomach one-half hour after eating. A heavy meal particularly brought this on; milk and toast did not provoke pain.

On February 13, 1926, he was put on ulcer diet with considerable relief. February 19, 1926, had pain in the lower abdomen; pains were sharp and radiated through to the spine. On March 21, 1926, the pain in the lumbar region again became severe and kept the patient awake nights. Four days later the patient noticed the urine was red in color. Nocturia three times; day six times.

Complained of being constipated three days prior

to admission; and passed black tarry stools with an enema.

Physical Examination: Skin smooth and dry. Eczema over left arm and forearm. Sclerae are icteric. Tongue—papillae are somewhat smooth. There was emaciation of the thorax. Heart and lungs were negative. The abdomen was scaphoid shape; no masses were made out. The spine from the 10th thoracic is fixed; tenderness over the sacro-iliac joints.

Laboratory findings: Anisocytosis +++  
Poikilocytosis +++  
Polychromatophilia +++

	April 5	April 7	April 14	April 26
	65%	47%	33%	23%
Hemoglobin	C. I. 89	(1.02)	(1.16)	(1.13)
Red	3,950,000	2,310,000	1,580,000	1,120,000
White	8,900	13,000	18,000	24,320
Polymorphonuclear	49%	68%	68%	84%
Lymphocytes	40%	19%	28%	11%
Monocytes	1%	4%	1%	4%
Eosinophiles	10%	8%	3%	1%

Nucleated reds ++

Color index indicates primary anemia.

Fragility test normal.

Gastric analysis: No free HCl.

Feces: Blood and pus.

Urine: Sp. gr. high; no albumin; sugar negative.

April 26. Urine: 1st examination: Reds 10-20; whites 1; bile and urobilin in urine on April 2, 1926; no biliary pigments after April 8th.

Urobilin 1+

Urobilinogen + once, otherwise negative.

Functional test of kidney 25% - 22%; total 47%.

Blood chemistry:

	April 5th	April 12th
Urea	31.3	25.
Creatinin	1.7	1.3
Sugar	.112	.143

April 26: Cholesterol 476 mgm. per 100 c.c. Blood culture negative.

X-rays: Stomach—negative.

Colon—colitis

Chest: Increase in vascular markings suggesting congestion.

Spine: Chronic hypertrophic arthritis of lumbar spine; chronic arthritis in sacro-iliac joint.

Skin: Lichen chronica simplex.

Fundi—negative.

Neurologic examination negative.

Diagnostic Impressions:

1. Malignancy of the gastro-intestinal tract with metastasis to liver.
2. Pernicious anemia with superimposed streptococci septicemia.
3. Hodgkins.

Pathological Findings: The liver is riddled with fairly large white irregular areas of metastasis. On the posterior surface of the stomach, near the greater curvature, the mucous membrane is puckered with a central healed ulcer. There is no induration of the muscular wall. Microscopically this ulcer proved to be carcinomatous. There was involvement of the regional

lymph nodes; glands of the hilus of the spleen; gastro-hepatic ligament and retroperitoneal lymph nodes, especially around the spine; metastasis to the liver, pancreas and lungs.

Conclusions: This case is striking from several angles: (1) He exhibited a rapidly developing anemia of a primary type (color index high) without any evidence of hemorrhage, and no particular hemolysis. The hemolysis idea is emphasized because during the period anemia occurred there was a rapid disappearance of jaundice. (2) The gastric symptoms were first noted February 6, 1926, with pain in the lower abdomen thirteen days later, February 19th. At this time invasion of the lymph glands along the spine must have occurred. (3) The acute infectious temperature curve, leukocytosis, with progressive anemia and no evidence of localizing symptoms. It must be added, however, that acute invasion of the liver by carcinoma can do this. (4) The rapid and extensive invasion from an almost microscopic lesion primary in the stomach.

The meeting adjourned.

CARL B. DRAKE, M.D.  
Secretary.

## PROGRESS

Abstracts to be submitted to Section Supervisors.

Members are urged to abstract valuable articles which they run across in their reading and send the abstracts to the physicians in charge of the respective sections. In order to avoid duplication it would be well to communicate with one of the section supervisors before the article is abstracted.

## MEDICINE

### SUPERVISORS:

F. J. HIRSCHBOECK,  
FIDELITY BLDG., DULUTH

THOMAS A. PEPPARD,  
LA SALLE BLDG., MINNEAPOLIS

THE LARGE MONONUCLEAR AND THE TRANSITIONAL LEUKOCYTE OF HUMAN BLOOD: F. A. McJunkin, M.D., St. Louis, Mo. (Jour. of Lab. and Clin. Medicine No. 1, Oct. 1926, p. 71). "Large mononuclear" and "transitional" are terms used for many years in the differential enumeration of the white cells of blood. The author describes in his paper certain microchemical and staining reactions which are helpful in the identification of these cells. His conclusions are that cells of three varying origins are included under this term:

1. The "transitional" leukocyte (monocyte of Naegeli), which is the peroxidase-reacting mononuclear phagocyte of human blood, and is of myeloid origin.



2. The "large mononuclear" which is a non-peroxidase-reacting cell characterized by certain granules, when the living cell is brought into contact with a dilute solution of neutral red. This cell is called "lymphotheliocyte" by the author.

3. The "hemendotheliocyte" is a phagocyte derived from the vascular endothelium which may appear in the peripheral blood of the rabbit under experimental conditions. When stained with neutral red, this cell may present a diffuse granulation or may be devoid of granules. There is no evidence that it is present in normal human blood.

G. L. BERDEZ, M.D.

## SURGERY

### SUPERVISORS:

DONALD K. BACON,  
LOWRY BLDG., ST. PAUL

VERNE C. HUNT,  
MAYO CLINIC, ROCHESTER

### RESULTS OF X-RAY THERAPY OF MALIGNANT GROWTHS OF THE URINARY TRACT:

Lewis T. Mann, M.D., New York City (Surg., Gynec. and Obst., 1926, XLIII, No. 4, 529). The final results are given which were obtained from the use of deep x-ray therapy in the treatment of malignant neoplasms of the kidney, bladder and prostate. The cases were observed at the Mount Sinai Hospital, New York City, from the service of Dr. Edwin Beer and the members of that service. In this group of cases there are some treated with deep x-ray therapy alone, some by surgery combined with x-ray and some with radium and x-ray and others with a combination of all three.

The first group considered in this article was the malignant growths of the kidney, of which there were 11 cases. It was thought that the results with deep x-ray therapy were no better than those obtained by surgery alone as was shown by Hyman in a recent article.

The next group was bladder tumors, of which 17 were carcinomata and two papillomata. Relief from symptoms, dysuria, hematuria, et cetera, was reported in 3 cases only, and recurrences were noted in 13 cases. The author does not think life has been prolonged by the use of x-ray. The mortality was about the same as when no x-ray therapy was used; and there were no cures.

In the group of prostatic carcinomata, there were 12 cases. It was uncertain whether or not life was prolonged by the use of deep x-ray. Symptoms of hematuria, dysuria and frequency were relieved in two cases, but in the remaining cases it was temporary or none at all. No permanent decrease in the size of the tumor mass was noticed; however, none grew rapidly after x-ray therapy, and obstruction to urination did not occur. The author thinks that x-ray therapy should be used in carcinoma of prostate as a palliative measure.

M. P. OMOHUNDRO, M.D.

**POLYCYSTIC KIDNEY:** Carmelo Atonna and Johns H. Morrissey (Ann. Surg. 1926, 84, 846-94—). Within the past five years there has been an increase in the number of polycystic kidneys diagnosed before necropsy, due largely to the aid of pyelography. The authors classify them into three types.

First, those with renal insufficiency, rapidly followed by death. They are hopeless from the standpoint of treatment and are usually diagnosed only at necropsy. The second group are those presenting symptoms of chronic nephritis with dull back pains, headache, visual disturbances and blood-pressure changes. The diagnosis is difficult especially if the cysts remain small. As the cysts develop in size the kidney tissue undergoes atrophic degeneration as the result of increase in the intracapsular pressure, especially when the capsule is firm and unyielding as a result of inflammatory change.

A third type of cases includes those in which symptoms appear that direct attention to the urinary tract. The development of cysts adjacent to the pelvis may produce intrapelvic hemorrhage and hematuria, sometimes accompanied by ureteral colic.

The value of pyelography in diagnosis cannot be overestimated although it must be used with some caution because the reaction may be severe.

Medical treatment is, as a rule, the method of choice and the principles guiding the treatment of chronic nephritis should be closely followed.

Numerous examples of nephrectomy for a kidney tumor, afterwards discovered to be a polycystic kidney, are on record. The mortality of this procedure is very high, as the condition is practically always bilateral. The most efficient surgical procedure has been puncture or excision of the cysts and this method of treatment has been championed by Rovsing. Opinion is divided, however, and Brin reported the mortality in sixteen cases treated in this way at 25 per cent.

Hematuria as a symptom occurred in one-half of the cases reported by one investigator. It is usually intermittent in character, lasting for several days or weeks and followed by a complete remission. In the pyelogram the pelvis is stretched out to four or five times its normal length with separation of the calices at each pole. There is usually but slight change in the depth of the pelvis.

HAROLD E. SIMON, M.D.

**PARALYTIC ILEUS AS A COMPLICATION OF ACUTE APPENDICITIS:** Guilford S. Dudley, M.D., of New York City (Annals of Surgery, Vol. LXXXIV, No. 5). The author thinks that intraperitoneal infection is the cause of the condition known as paralytic ileus, which may cause varying degrees or total obstruction. If total obstruction does not occur it is thought that it is the individual's resistance which overcomes the infection. It is also stated that it differs from mechanical ileus, because of the tendency to spontaneous resolution of the obstructing factors. He thinks that the abdominal distension, which is a common post-operative complication without infection of the peritoneum, is due to a diminution of intestinal muscular activity and is caused by operative trauma. It is dis-

tinguished from true paralytic ileus in that it never causes complete intestinal obstruction.

The conclusions of this article are based upon a study of 48 cases of acute appendicitis which showed diffuse unlocalized peritoneal infection at the time of operation and occurred among 540 cases on the Second Surgical Division of Bellevue Hospital. Of these 48 patients 26 died and 22 recovered. Of the 22 that recovered, 2 were complicated by the paralytic type of obstruction—one of these with operation and the other without re-operation; 12, or 25 per cent, of these developed intestinal obstruction of the paralytic type and 10, or 40 per cent, of the deaths were due to intestinal obstruction.

It was thought that possibly the delay of enterostomy in the earlier cases was probably responsible for the high ratio of deaths to recoveries.

The author recommends that every acute suppurative appendicitis should be treated surgically with a view to possible subsequent development of paralytic ileus, which first calls for minimum operative trauma and spread of infection. Treatment recommended following operation is local treatment to abdomen, saline solution by hypodermoclysis, and withholding fluids by mouth for 24 hours or longer and free use of morphine. Then if distension and vomiting occurs, gastric lavage and colonic irrigations are indicated. If there is still no relief drainage of the intestinal tract by jejunostomy should be done.

M. P. OMOHUNDRO, M.D.

**THE MANAGEMENT OF CARCINOMA OF THE ESOPHAGUS:** M. C. Myerson (Surg., Gynec. and Obst., 1926, 43, 690-695). Carcinoma of the esophagus occurs usually in men after the age of 50. The most frequent site of the lesion is the middle third of the esophagus; that occurring in the lower end is usually associated with and secondary to a carcinoma of the stomach. While others are attempting to learn the cause of cancer it is our duty to make the remaining term of life of these patients as comfortable as possible.

Today gastrostomy is advocated by a majority of men. When employed, it is to the advantage of the patient not to delay until the later stages of the disease when the mortality of the operation becomes an important factor. It is a safe procedure when performed early but at best is uncomfortable and embarrassing. Quick is of the opinion that radium therapy has but little influence on this type of lesion.

A third method that has not yet been taken up in this country to any extent is the method of dilatation plus intubation of the carcinomatous area. The author believes it to be a proved substitute for gastrostomy and an improvement over dilatation alone. When intubation is practiced, dilatation is required only once and the tube is worn for the rest of the patient's days provided silver tubes are used.

He recommends that the dilatation be done over a string and through an esophagoscope. The esophago-

scope is then withdrawn and the intubation tube dropped into the upper esophagus by means of a Jackson speculum. The esophagoscope is again introduced and the intubation tube gently placed in position by means of forceps. If necessary the procedure may be carried out in two stages. Its patency and position in the esophagus is checked by fluoroscopy.

The author employs a light-weight, solid German silver tube the upper end of which is expanded and funnel shaped. It is oval in shape and its caliber is greater than that usually employed.

The patient is permitted to eat anything provided he eats small enough quantities and masticates well. He is also urged to drink fluids freely with his meals. The patients do not feel the presence of the tube and can swallow the food to which they have been accustomed.

HAROLD E. SIMON, M.D.

**INTESTINAL OBSTRUCTION:** W. B. Holden (Arch. of Surg. 13, 882-886), 1926. There is no phase of abdominal surgery that offers so great an opportunity for improvement in its results as that of intestinal obstruction. The majority of deaths following operations are due to late operations.

There are five cardinal signs and symptoms in the diagnosis:

1. Pain, sudden in onset and severe and cramping in character;
2. Vomiting, at first reflex but later due to an overflow from reverse peristalsis;
3. Blocked bowel;
4. Visible peristalsis which is an early rather than a late sign and is very significant;
5. Absence of fever during the first forty-eight hours.

There are other signs and symptoms but these five are sufficient to make the diagnosis. The use of morphine obscures the diagnosis, and together with the giving of cathartics is responsible for many of the deaths in these cases.

An early operation within the first twelve to twenty-four hours is imperative, and an ample mid-line incision, with evisceration of the obstructed portion of the bowel, is essential to finding and relieving the cause of the obstruction. In addition, the bowel must be emptied of its toxic contents and this the author accomplishes by inserting a piece of glass tubing of large caliber into the intestine near the point of obstruction. The glass tubing is connected with about two feet of rubber tubing and the fluid is forced out of the intestine by gently stripping it from above downward. Temporary ileostomy is not used because it usually provides drainage of only a few loops of bowel. Morphine is given post-operatively and fluids are supplied by proctoclysis. Gastric lavage is rarely necessary if the bowel is thoroughly emptied.

The author reports a series of 135 cases with 26 deaths from all causes, a mortality rate of 19.2%. By carrying out the above principles he believes that one need have no more dread of intestinal obstruction than he would of gall-stones, ulcer of the stomach or pelvic tumors.

HAROLD E. SIMON, M.D.

## PEDIATRICS

### SUPERVISORS:

CHESTER A. STEWART,  
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ROY N. ANDREWS,  
MANKATO CLINIC, MANKATO

**HELIO THERAPY AND ACTINOTHERAPY IN RELATION TO PEDIATRICS:** Frederic W. Schlutz, M.D. (*Amer. Jour. of Diseases of Children*, December, 1926.) Light therapeutics, both natural and artificial, is gradually assuming a more important place in the treatment of disease.

Worringer (1923) found that the blood calcium increases when the children are irradiated by a mercury vapor quartz lamp. At the same time the symptoms of hyperexcitability disappear. The results were usually obtained within two to four weeks of treatment.

McCaskey says: "The changes produced by irradiation are eminently constructive, and belong to the plus side of the patient's vitality ledger."

Progressive pigmentation of the skin under ultraviolet ray therapy is an index of defense against excessive changes in the chemistry of the blood.

Cori and Pucher (1923) found that roentgen-ray therapy produced a marked increase in urinary nitrogen and phosphates. Analysis showed that the total calcium content of the irradiated animals was appreciably greater than that of the control animals.

Irradiation of the dogs increases the endogenous nitrogen metabolism, stimulates the absorption of calcium and phosphorus from the intestine, and decreases the blood sugar. These changes persist and are sometimes more apparent after irradiation has ceased. Serum phosphorus is markedly increased by irradiation, in some cases 300 per cent.

The use of light in the treatment of disease has been applied in many branches of medicine. Those of most interest to the pediatrician are tuberculosis and rickets.

To Rollier more than to any one else is owed the development of heliotherapy as a clinical aid. He has shown that a large number of surgical cases can be cured without operation. Rollier has dealt mostly with extrapulmonary tuberculosis. He believes heliotherapy would be a useful factor in the treatment of the great majority of cases of pulmonary tuberculosis. Both Rollier and Finsen were convinced that heliotherapy at a high altitude was most beneficial. Jaubert (1913) believes that the best results from altitude are obtained at an elevation of from 2,000 to 3,000 feet. At high altitudes, on the contrary, the air is transparent, free from solid particles, and easily traversed by the sun's rays, which pass through without absorption, and warm and invigorate the body of the patient while leaving the air cool and fresh.

Campbell (1916), in the treatment of bone and joint conditions, states that the most interesting features about heliotherapy are: 1. Sequestrums are rapidly expelled. 2. Marked and early beneficial effects are obtained in severe septic conditions. 3. There is a

rapid evolution of tuberculous processes resulting in bone ankylosis, not the mobilizing action Rollier speaks of.

Chilling may cause irreparable harm, therefore care must be taken that no breeze strikes the body. After each sun bath the patient is given a sponge bath; if the skin is very sensitive, a vegetable oil such as olive or coconut oil is applied.

Robertson (1924) is enthusiastic about quartz lamp therapy in cases of tuberculous cervical adenitis, lupus and tuberculids.

Heliotherapy can be used for tuberculosis of the lungs when the disease is of the simple focus type which approximates surgical tuberculosis in character. Good results have been obtained in patients with the pleural type, the bronchial asthmatic type and in those who have no fever and the activity of the disease has been arrested. Sun treatment for pulmonary tuberculosis is contraindicated in cases with smoldering activity of the tuberculous process, with a tendency to autoinoculate on exertion, to hemoptysis, and to other signs and symptoms of activity.

Hall (1925) considers that ultraviolet light is a potent remedy for pulmonary tuberculosis and that both adults and children do well when thus treated. Too rapid pigmentation is to be avoided.

R. N. ANDREWS, M.D.

**STUDIES IN NUTRITION—CONSIDERATION OF THE FOODS:** William Weston, M.D. (*Archives of Pediatrics*, December, 1926). When the four representative grains, wheat, oats, yellow corn and rice, are evaluated upon a fat, carbohydrate, protein, mineral and vitamin basis, it is found that each has certain advantages and disadvantages, but that if used in combination as whole grain, the result will show such a compensation that comparison with a single whole grain cereal is decidedly to the disadvantage of the single cereal.

Cereal products consist almost entirely of white bread and the highly milled preparations, such as cream of wheat, farina, grape nuts, corn flakes, etc. Consequently, pearl grits, farina and many others of this class are so deficient that their use should be discouraged.

Feeding experiments by several investigators have conclusively demonstrated that the ready-to-serve cereals as represented by grape nuts and corn flakes possess so little value that their use should be abandoned.

It is probable that an average size slice of whole wheat bread, made from especially selected wheat and properly milled, will contain a greater proportion of some of the essential nutritive elements than will an entire loaf of white bread. The cereals when used as whole grains, properly grown and scientifically selected, are among our most valuable foods.

Meats, including fish and poultry, are valuable sources of protein and of certain of the mineral elements, especially phosphorus and iron.

Pork and its products, ham, sausages, etc., are so difficult to digest, that they should be excluded from the

diet of children. Vegetables, especially spinach, green cabbage, string beans, beet and turnip tops are essential to normal growth, development and well-being. Raw cabbage is an excellent source of vitamin. McCollum considers green vegetables and egg yolk as second to milk in importance as a source of vitamin A and calcium. Fruits, especially the citrus fruits and tomatoes, occupy an important place in the diets of children and to a lesser extent adults.

The most valuable of the tubers are: Carrots, yellow sweet potatoes, white potatoes, beets, parsnips and rutabagas. Among the legumes may be mentioned kidney and navy beans, young green peas and snap beans. The chief value of the various nuts consists in their vitamin and mineral values. There is no satisfactory substitute for pure milk.

Among the more important conditions that influence the composition of milk are: Breed of cattle, feeding and care, season of the year, time and completeness of milking.

Milk contains in number all the inorganic elements necessary to nutrition. It is especially rich in calcium, the mineral element in which the American diet is most often deficient. Milk from properly fed cows will contain a liberal amount of vitamins A, B, C, D, and E.

In point of food value eggs occupy a position only second to milk in their nutritive value.

The more general appreciation and use of milk, cod liver oil, eggs, green vegetables, whole grain cereals and fresh fruits, in the diets of children, is perhaps the most notable achievement of the science of nutrition in the field of preventive medicine.

R. N. ANDREWS, M.D.

**KETOSIS IN CHILDREN:** Philip Cohen, M.D. (Archives of Pediatrics, December, 1926). There are three types of ketosis in childhood classified according to their carbohydrate metabolism. The first type is due to a depletion of carbohydrate reserves of the body by starvation, shows a hypoglycemia, and is quickly relieved by relatively small amounts of carbohydrates.

The second type is one where the carbohydrate metabolism is abnormal. This type is always caused by infection and may be due to either one of two causes, a temporary pancreatic insufficiency, or to a lowered hepatic function. The apparently diabetic type is best treated by glucose and insulin, and the apparently hepatic type can be relieved by glucose alone, except in severe cases, when insulin seems to be indicated.

The third type is one where the blood sugar is normal, the carbohydrate metabolism is normal, glycosuria is present and infection the cause. This type can be cured by glucose alone. The postulated mechanism is a deficient glycogenolysis or an excessive glycogenesis. This type is best treated with glucose alone, in spite of the glycosuria.

In all cases of ketosis, fluids should be forced and bicarbonate should not be given, but a buffer alkali may be used if an alkali is indicated.

R. N. ANDREWS, M.D.

## ROENTGENOLOGY

### SUPERVISORS:

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**OBSERVATIONS ON THE FUNCTION OF THE STOMACH AFTER GASTRO-ENTEROSTOMY AND SIMILAR OPERATIONS:** Arisz (Acta Radiologica, 30:vi, 1926). The author analyzes the conditions found in stomachs after gastro-enterostomy. These vary with the degree of emptying through the new opening, and with posture, which indirectly affects emptying. Peristaltic movements and the pyloric mechanism are not changed, but there is a lessening of the mobility. If ulcers continue to exist after enterostomy, they continue to cause spastic deformities of the gastric wall and to hinder peristaltic movements.

Two cases are described in detail where enterostomy was made, but in which the ulcers failed to heal. Both cases were successful in the control of symptoms, but subsequent operative check for other conditions revealed that the ulcer itself was not influenced in a favorable way, but grew worse, changing from a superficial ulcer of the mucous membrane into a deep indurated ulcer.

WALTER H. UDE, M.D.

**RADIOGRAPHY OF THE JOINTS WITH IODIPIN:** Sievers (Fortschritte a. d. Geb. d. Roentgenstrahlen, Sept., 1926). The author recommends a 49 per cent solution of Iodipin as an opaque liquid for the radiography of joints, especially the hip joint. Iodipin is especially suited for this purpose, as it delineates, even in thin layers, sharply and full of contrast, is harmless for the tissues, and checks adhesions in consequence of the sesamoid which it contains. The method of study has been limited to the study of congenital dislocation of the hip joint. It is very helpful in the young, where diagnosis is made difficult by incomplete ossification, as it demonstrates the relative condition of the cartilaginous head and acetabular cavity, gives a surer foundation to the prognosis in regard to reposition and retention than with an ordinary roentgen-ray plate, as one can thus better recognize the details of the interior cavity of the joint, especially width and opening of the isthmus, situation of the limbus cartilaginous, and the condition of the surface of the cartilaginous acetabular cavity. Even irregular places in the covering of the joint cartilage of the head are demonstrable with Iodipin, as shown in a case of Perthes' disease. The Iodipin is also thought to have therapeutic value, being a mechanical buffer and chemically disinfecting the joint by means of the slowly liberated Iodine.

The technic of the injections is rather difficult, as one must carefully avoid getting any of the substance into the soft tissues in the neighborhood of the joint. The authors have arrived at a satisfactory method of making these injections, and describe this in detail.

WALTER H. UDE, M.D.



**THE ROENTGENOLOGIC DIAGNOSIS OF LIVER ABSCESS WITH OR WITHOUT SUBDIAPHRAGMATIC ABSCESS:** Pancoast (Am. Jour. Roent., October, 1926). The roentgen-ray diagnosis of subdiaphragmatic abscess has become a comparatively simple problem, ever since it was first detected by this method. Hepatic abscess, however, has always seemed to be a very difficult condition to determine, until quite recently, when the pathologic aspect and its close relation with subphrenic abscess as a sequel, became known. We have to deal with hepatic abscess due to ascending portal or biliary tract infection. All other agencies and intrathoracic conditions likely to cause confusion in interpretation must be eliminated by carefully correlated clinical facts.

A study of many cases collectively reveals many important and characteristic features in common. The following essential principles must always be carefully considered:

1. A correct clinical history of the case is of paramount importance in order to lead to the correct interpretation of the findings.
2. A knowledge of the pathology of liver abscess.
3. Correct technic of the examination, which must include roentgenoscopy in order to be able to study diaphragmatic movements.
4. Ability and knowledge to differentiate the findings.
5. Collaboration with the clinical diagnostic procedure.

Roentgenologic features, briefly enumerated, are:

1. Elevation of the dome of the diaphragm, usually the right;
2. Absence of anything past or present above the diaphragm to account for these appearances, except a correctly interpreted lung retraction or small effusion;
3. Restricted movement;
4. The exclusion of numerous other conditions below the diaphragm.

Sixteen cases are briefly reported, and the findings in each are discussed.

WALTER H. UDE, M.D.

**THE ROENTGEN TREATMENT OF METASTATIC CARCINOMA OF BONE:** Phahler (Acta Radiologica, Vol. vii, p. 280). The author expects only palliation and not cure. As a result of treatment he has obtained prolongation of life of from one to four years. Healing of bone metastases can be obtained by means of Roentgen Ray Treatment even when there is an associated fracture. The treatment must be sufficiently effective to destroy the carcinoma cells in the bone, but the osteoblasts must not be destroyed, as upon these depends the process of recalcification. If the latter are destroyed the area undergoes liquefaction and subsequent abscess formation. Fifty to 80 per cent of an erythema dose to the skin is used, with sufficient portals to secure 100 per cent depth dose within a period of ten days.

WALTER H. UDE, M.D.

## EYE, EAR, NOSE AND THROAT

### SUPERVISORS:

VIRGIL J. SCHWARTZ,  
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FIDELITY BLDG., DULUTH

**SURGICAL REMOVAL OF CORNEAL OPACITIES:** Meyer Wiener Jackson Birthday Volume, There is experimental and clinical evidence to show that a more or less successful effort is made in the formation of new corneal tissue to replace that which has been destroyed. In rabbits there is a thickening of the corneal remnant after resection of a major portion of its thickness. Donders had found years before that the newly formed epithelium may cover the entire denuded area in two days and that it was thicker than before, but that it became gradually reduced to normal thickness; that the new corneal tissue gradually approaches normal thickness without ever actually reaching it; that no severe complication follows removal of one-half to two-thirds the corneal thickness.

Wiener was able to verify these results, except that epithelial regeneration required five to seven days. Salzer found true corneal regeneration in non-perforating trephine wounds, the process being most active just beneath the epithelium. Others have noted varying degrees of regeneration of the cornea, and Johnson has operated upon fifteen such cases with encouraging result.

The object of the operation may be cosmetic, prophylactic, for the prevention of recurrence of corneal ulcers, or therapeutic, for the improvement of visual acuity. Under cocaine anesthesia a crucial incision is made vertically and horizontally through the scar with a small, sharp scalpel, almost to the limbus and as deep into the cornea as possible without perforating it. The apex of one quadrant is now lifted up with a tiny iris hook and, with the scalpel, is gradually dissected back to the periphery, taking care to remain in the same corneal layer throughout. This is not difficult, for the line of cleavage is clear. At the periphery each quadrant is resected. As after-treatment, atropine and xeroform (the latter as a powder) are used when the dressing is changed each day. In five to seven days the epithelium is completely formed. About two weeks later the cornea is usually milky and more hazy than just after the operation, but gradually this clears and the cornea becomes more transparent and the vision improves.

Three cases operated upon in this way are reported, with good results; of course there are also many failures. When there has been perforation of the cornea with an anterior synechia the prognosis is poor, unless the scar is first resected in the most favorable area, and an iridectomy is done later.

The less inflammation and the more free the cornea from vascularity, the better the result. Xeroform is used after the operation because it is a very fine powder which does not cake or irritate, has strong antiseptic properties and has an anesthetic effect. Cold applications are then applied for several months to prevent vascularization, and dionin is used, beginning with a 1 per cent solution and increasing to saturation.

If a localized ectasia develops, the addition of 1-1,000 adrenalin solution to the usual treatment corrects the swelling.

VIRGIL J. SCHWARTZ, M.D.

**SEROUS EXUDATE BENEATH THE RETINA CLINICALLY SIMULATING SARCOMA OF THE CHOROID OR CILIARY BODY:** William T. Shoemaker, Jackson Birthday Volume. A man, aged 73, complained of gradual loss of vision in the left eye for several months, especially in the upper field. He had had pneumonia a year ago, but, so far as he knew, was now in good health. The right eye was normal except for ametropia. The left eye showed a slightly shallow anterior chamber and a sluggish pupil with a visual acuity of hand movements at close range in the lower field only—not in the upper field at all. The left anterior chamber was rather shallow and the pupil gave a sluggish light reaction.

The ophthalmoscope showed a widespread detachment of the retina below, nasally and superiorly. A smooth, clear-cut, pendulous brownish mass was seen directly behind the lens, upward and inward, apparently continuous laterally with the ciliary body. The detachment was not movable, that is, it was solid, and while the surface and edge of the main mass were too smooth to be a typical sarcoma, all the other evidence, including dense opacity on transillumination, pointed toward a solid growth.

On removal and section the eyeball was found to contain, not a sarcoma, but a large, serous subretinal exudate of dark color. There was evidence of an old iridocyclitis which might have resulted from the pneumonia.

VIRGIL J. SCHWARTZ, M.D.

#### SALE OF ULTRAVIOLET GENERATORS TO THE PUBLIC

The Council on Physical Therapy, on the basis of the available evidence, contends that the sale of generators of ultraviolet energy to the public for self-treatment is without justification. The Council bases its condemnation of the sale of such apparatus on the ground that harm may result from such use by the public; because unwarranted confidence in the therapeutic value of treatment with such apparatus may lead to attempts to treat serious conditions; because the possessor of such apparatus would fail to obtain a correct diagnosis of his condition; and because the practice would encourage the sale of useless and fraudulent apparatus. (Jour. A. M. A. Jan. 22, 1927, p. 245.)

## CASE REPORTS

Members are requested to report interesting and unusual cases for publication in this department. Many cases reported at hospital staff meetings and similar meetings are very instructive and worthy of publication.

### MECKEL'S DIVERTICULITIS WITH GANGRENE\*

REPORT OF CASE

MARTIN S. SICHEL, M.D.

Resident Surgeon, Minneapolis General Hospital  
Minneapolis

J. W., aged 21 months, female, was admitted to the General Hospital on December 3, 1926. The present illness was of 72 hours duration. The onset was characterized by acute cramplike pain throughout the lower abdomen. At this time an enema was given with good results. That night the patient suffered more cramplike pain and vomited several times. The pain and vomiting persisted during the following day. There was no bowel movement from the onset up to the time of admission, nor was any blood or mucus passed. Twenty-four hours prior to admission the abdomen became distended.

Physical examination showed a twenty-one months old female child, moderately prostrated, pale, acutely ill, but in good general physical condition. She was moderately toxic. The head was normal, the pupils reacting to light; the throat was negative. The heart was normal and the lungs clear. The abdomen was moderately distended and everywhere tender to palpation. There was generalized muscular rigidity most marked in the right lower quadrant. No definite masses were made out. The extremities and reflexes were normal.

On admission the temperature was 100°; the pulse 130 but regular and of fair quality; and the respirations 24. The urine was negative. The W. B. C. 12,500, with 49 per cent polymorphonuclears, 37 per cent lymphocytes, and 14 per cent large mononuclears.

An x-ray of the chest and abdomen showed the heart and lungs to be normal. There was a marked gaseous distension of the intestines suggesting the possibility of an intestinal obstruction.

A diagnosis of an acute surgical abdomen was made and it was decided to operate immediately. A differential diagnosis was made between acute ruptured appendicitis with general peritonitis and acute intestinal obstruction from volvulus.

At operation under general anesthesia a lower mid-rectus incision was made. There was no free fluid in the abdomen. The appendix presented in the abdominal incision. The walls were reddened and injected and slightly thickened but it did not seem sufficiently involved to account for the symptoms. It was

\*From the Surgical Service. Division B, Minneapolis General Hospital.

removed and inverted. The abdomen was then explored after enlarging the incision and what was apparently a gangrenous bowel found just beneath the mid-line in the lower abdomen. Around the site of the gangrenous bowel there was a volvulus of the ileum, there being a dilated bowel above this point with redness and injection of the walls of the gut. There were many fresh adhesions about the volvulus and these were separated with difficulty, thus freeing the loops of the bowel. The gangrenous portion of the bowel was then seen to consist of a Meckel's diverticulum, about the size and shape of a thumb. This was located about 10 inches proximal to the ileocecal juncture. The gangrenous portion of the diverticulum involved about one-half of the lumen of the ileum. In order to remove the diverticulum it was necessary to resect the portion of the ileum to which it was attached. This was resected and an end-to-end intestinal anastomosis



Meckel's diverticulum with attachment to ileum.

done. An enterostomy was then done just above the anastomosis, introducing a soft rubber catheter into the lumen of the ileum. A large amount of thick, dark brown, foul smelling intestinal fluid was obtained upon opening into the lumen of the ileum. Two Penrose drains were placed in the abdomen for drainage and the incision closed.

The operation consumed one hour and forty-five minutes and the patient's condition at the end of the operation was very poor. Despite forced fluids and stimulations the child died four hours later.

The pathological examination of the specimens showed the appendix to contain numerous foci of lymphocytes in the serosa—a mild secondary appendix. The Meckel's diverticulum showed a wall that was entirely necrotic, with hemorrhages, and occasional areas of lymphocytic infiltration. A post-mortem was not obtained.

## MYASTHENIA GRAVIS\*

### CASE REPORT

JOEL C. HULTKRANS, M.D.  
St. Paul

This case is that of a young lady, aged 20, single, farmer's daughter, referred to us by Dr. George Earl.

She came to the hospital complaining of difficulty in swallowing. Her trouble was first noted about a year and a half ago by the fact that at times her voice became nasal and if she was tired this was always more marked, and when she was especially fatigued she had to swallow with care or liquids would go up through her nose. She also noticed a general feeling of unnatural weakness throughout her whole body. She has a marked tendency towards constipation. Her condition remained about stationary, or probably a little progressive, until about two months ago, when she began to notice that her eyelids would droop at times, and when she was especially tired she had difficulty in keeping her eyes open. This was more noticeable on the left. Her eyes would tire after using them for short periods, and after continued talking her articulation became indistinct.

Her general physical and laboratory examinations were negative. Neurologically she had involvement of the third, seventh, ninth, and twelfth cranial nerves. Myasthenia gravis, when it affects the bulbar muscles, as it does in this case, produces all the features of a bulbar paralysis, from which it must be differentiated. There are three differential points which I will demonstrate in this case: (1) The absence of atrophy. In this case although the onset dates back a year and a half there is no atrophy of the affected muscles. (2) The degree of paralysis varies from time to time, becoming accentuated by fatigue. If we ask this patient to contract the musculature of her face or close her eyes, you will notice that she does it very well, and as she keeps it up I am sure you can all see that the contractions are becoming weaker until it is quite impossible for her to make any further contractions or close her eyes. If we give her a little rest she will be able to repeat the same performance. (3) The myasthenic electric reaction, a series of Faradic shocks which, produce at the onset contractions of the muscles affected and these contractions become gradually less and less until at last no reactions to the strongest Faradic shock result. If we wait a few minutes and then test again we find that the Faradic excitability has reappeared and can again be exhausted in a similar fashion. With these three points the diagnosis of myasthenia gravis is of course obvious.

Comment: This condition is very rare. Its etiology is not known. Some of the theories advanced as to its cause are: toxic; that it is on a blood endocrine basis; or that there is a congenital deficiency of nervous tissue. As to pathology: A persistent hyperplastic thymus has been found in some cases, and should always be looked for; others report a round cell infil-

\*Read before the Ramsey County Medical Society, Clinical Meeting, St. Joseph's Hospital, Oct. 25, 1926.

tration in the muscles; and some, microscopic changes in the motor cells. As to the prognosis, at best the outlook is not good, although spontaneous remissions and cures have been reported. As to treatment, best results are reported where a persistent thymus has been found and treated with x-ray. The only medication of sufficient value to mention is strychnia. Symptomatic treatment, and proper management mainly in evaluating the endurance of the patient, offer probably as much in results as any other treatment.

### EPIDEMIC ENCEPHALITIS—ILLUSTRATING CHANGED CLINICAL PICTURE OF TODAY\*

REPORT OF TWO CASES

C. EUGENE RIGGS, M.D.  
St. Paul

*Case 1.*—H. Referred by Dr. Meyers, Superior. Age 20 years. Student in the Normal School; consulted us Sept. 9, 1926, complaining of paralysis of the lower limbs. There was a paresis of the upper extremities. Family history negative. Scarlet fever when a child. Influenza in 1918. Three years ago, while playing a piano accompaniment for a high school opera, he was under a good deal of nervous strain, due to the fact that he had to cover up mistakes of the players, by improvising during the act. After the opera was over, he almost collapsed nervously. Ever since this episode he has been very nervous and tense when playing in public. Shortly before Christmas, 1925, he became sleepless, restless, irritable and depressed. Later, awaking one morning, he noticed peculiar sensations in the limbs, which he regarded as rheumatic. There was also a good deal of pain and weakness in both legs. The attacks occurred, usually, at monthly intervals. During these seizures, which lasted a couple of hours, he was able to stand on his feet; ascending the stairs was very difficult, and he could scarcely lift his feet from step to step. The attacks continued until about April 1, 1926, when a different type of nervous phenomena added itself to an already complicated clinical picture. These have been occurring from every two to four days. They manifest themselves about three or four o'clock in the morning; he awakes and finds himself only able to move his head a trifle and the ends of his fingers; otherwise he is completely paralyzed until about three o'clock in the afternoon, when the paralysis disappears. He is perfectly conscious during this time; there are no sensory disturbances. He is able to tell when an attack is going to develop and when it is going to disappear. There is no involvement of the bowels or bladder; no vertigo. Hearing and sight are not affected. Insomnia preceded his illness and continued during his hospital stay until after the use of acriflavine intravenously. There have been clearly marked behavioristic disorders. These two types of symptoms—the first of a moderate character and the second when he was completely paralyzed aside

from movement of the head and tips of fingers—have grown steadily worse since coming to the hospital.

The neurological examination showed a fine tremor of the extended fingers. Knee-jerks absent; left Achilles absent; right present. There was a marked loss of power in both limbs, especially in the left, while the upper limbs were slightly paretic. When lying on the floor, he could get up on his knees only; then had to be assisted to a standing position. The reaction of degeneration was present in both lower extremities; no sensory disturbances. There is, however, a slight facial asymmetry, evidently congenital, and bears no relation to his present illness. Aside from the behavioristic disorder, which was associated with a mild mental confusion, there has been no disturbance of the psyche.

Blood pressure 124 systolic, 85 diastolic; hemoglobin 92 per cent; red blood cells, 5,260,000; white blood cells, 6,800.

The serological examination of the spinal fluid was absolutely normal. After his second injection of acriflavine, September 24, he had one of the severe seizures. After the fifth injection he had another but it was very slight and this was the last. Under acriflavine, he regained muscular power very rapidly. A week after the first series of acriflavine injections had been administered, the knee and Achilles jerks returned. The restlessness, sleeplessness, mild mental confusion with behavioristic disorders, which was present on September 9 when admitted, disappeared after the first few injections of acriflavine.

Certain unusual features give a special interest to this case:

- (a) The possible relation of the facial asymmetry to the clinical picture.
- (b) The absence of Netter's triad—fever, diplopia and somnolence.
- (c) The two peculiar types of the clinical syndrome:
  - (1) Peculiar sensations in the lower extremities with the associated pain and weakness occurring at stated intervals.
  - (2) Attacks of complete paralysis with the exception of a slight movement of the head and tips of the fingers—a most unusual symptom complex.

The effect of acriflavine in this case was strikingly dramatic. After the first series of eight injections the symptoms were practically in abeyance—a startlingly rapid convalescence. The patient stated at this time he never felt better in his life and he ran up six flights of stairs to prove that he was again himself. Aside from sluggish deep reflexes, the patient returned home apparently perfectly well.

After the patient's return home, he had a respite of a couple of months, after which, unfortunately, the former symptoms returned, but to a much less marked degree.

*Case 2.*—E. Referred by Dr. L. J. Walker, Merrillan, Wisconsin. Twenty years of age; parents living and well; four brothers and one sister living and well. Usual childhood diseases; no complications. Had "typhoid dysentery" at the age of five years; influenza twice, 1918 and 1922. In April 1926, there was first

\*Presented before the medical staff of the Chas. T. Miller Hospital, October, 1926, and November, 1926.



noticed a numbness in the ends of the fingers of the left hand. This extended up the ulnar side of forearm and disappeared in about two months. Last May, she experienced difficulty in walking, and this has been steadily progressive. Several teeth were extracted and some filled in the latter part of June. After leaving Normal School, June 1, both the patient and her mother noticed that she would sleep a great deal, especially afternoons. For about two weeks she slept every afternoon and in the mornings as well. About the middle of July diplopia developed. In September, she became sleepless and would lie awake two or three hours during the night. At this time she developed sialorrhea. Speech is slow and labored. We have previously observed this peculiar enunciation in encephalitis. Recently she has noticed marked sluggishness of movements. Since October 1 she has not been able to handle herself with her natural briskness and celerity. There is a slight vacuous facial expression; lateral nystagmus of both eyes, most marked toward the left. Pupils contracted; light reflex slight.

Dr. Burch reports that "there is paresis of right external rectus muscle—a fairly common incident in encephalitis; the fundi are negative."

There is a diminution of all forms of sensation to the midline in the thorax and abdomen; the arm and leg are similarly affected. Aside from subjective sensation of numbness in the arm, the right side is normal. Babinski in right foot; questionable in left; knee-jerks apparently normal. Achilles present; ankle-clonus in both feet. Loss of muscle sense in the lower and upper limbs. No abdominal reflex on right side; epigastric only on left.

The serologic reaction of the spinal fluid shows 7 cells per cu. mm. Wassermann negative; sugar .120; globulin positive; goldsol 4455554100. The paretic curve, as in this instance, occasionally occurs; the Lange curve, however, is usually observed in the luetic zone. The increase in the sugar content is marked; this is no longer regarded as pathognomonic. An increase of sugar in the spinal fluid has been observed in paresis, cerebral syphilis, in a majority of the febrile illnesses, in convulsions, brain tumor and dementia precox. The hemi-diminution of all forms of sensibility on the left side possesses a peculiar interest. It can in no way be distinguished from that observed in hysteria. In a patient suffering from cerebral arteriosclerosis, now under our care, this hemi-sensory defect is clearly marked. It must be due to a psychic factor present in organic and functional disease alike. Miss E. has just received her last injection of acriflavine and states that she is feeling very much improved. The diplopia has practically disappeared; the sluggish muscular movements indicative of a developing Parkinsonian syndrome are no longer noticeable. The improvement in speech is very apparent, but that which has impressed me most, following the use of acriflavine, is the marked lessening, on the left side, of the hemi-sensory defect.

These two cases clearly portray the great change that has taken place in the clinical syndrome of epidemic encephalitis since 1918. Its clinic features today are atypical, bizarre and unfamiliar to the great mass of

medical men. I recall a patient of Dr. Gilfillan's, whom I had the opportunity to examine, evidently from the apparently prompt recovery an abortive type, who presented only two symptoms—a very severe epileptiform convulsion and a double Kernig. Another case in point was referred to me by Dr. Dodd of Ashland—a young man who had had an appendectomy, followed later by an operation for adhesions. This young man suffered from atrocious headaches, nausea, sleeplessness, marked asthenia and double Kernig. In both of these patients the spinal fluid was negative and there was no rise in temperature. In both H. and E. there was no acute initial illness. In the great majority of the cases that I have seen during the past two years, there has occurred no acute initial attack, but a gradual evolution of the symptoms.

### PRIMARY TORSION OF THE OMENTUM

REPORT OF CASE

A. E. COMSTOCK, M.D.  
St. Paul

On the afternoon of December 7, 1926, this patient, a salesman, married, aged 38, developed a severe pain in his abdomen, mostly on the right side and almost



Primary torsion of the omentum as described in the text.

directly over McBurney's point. He was forced to go home from work and went to bed. The pain continued throughout the night and I was called to see him on the

morning of the 8th. I found him lying in bed with his knees drawn upward. He was afraid to be touched and could lie only upon his back.

**Physical findings.**—His temperature was normal; pulse 90; some pain on his right side and excessive tenderness over McBurney's point; he was not nauseated, nor had he been from the beginning of his illness. He gave a history of having had cramp-like pains a week ago, but these disappeared during the night. At that time he had diarrhea, which had persisted.

**Treatment.**—Ice bags were placed upon his side with food restrictions. His wife called me at 4 o'clock and stated that his pain was much relieved; she was told to call me if the pain increased in severity. That night about nine o'clock she called and stated that the pain was getting more severe in character. He was sent to the hospital.

**Examination.**—A leucocyte count showed 17,000; no nausea; temperature normal; pulse 90.

My diagnosis was an acute appendicitis.

**Operation.**—The next morning (December 9th) he was operated upon. I made a right rectus incision and found the cecum injected and firmly adherent, with a small boggy appendix, somewhat congested, but not of sufficient degree to cause his symptoms; there was a large quantity of bloody fluids in the abdomen and I began to search further for trouble. The intestines were injected, but not distended; no peritonitis was present. I found a large hard knot of omentum lying toward the midline and above the umbilicus. This was carefully drawn out through the incision and found to be a primary torsion of the omentum with thrombosis and discoloration as far as the hard nodular portion. It had twisted itself from the distal end upward for about a distance of ten inches, in fact as far as it was possible to twist on account of its attachment to the colon. This was removed and the patient closed and returned to bed.

Convalescence was uneventful.

#### MALT-NUTRINE NOT ACCEPTABLE FOR N. N. R.

The Council on Pharmacy and Chemistry reports that Malt-Nutrine (Anheuser-Busch, Inc., St. Louis) is said to represent: "The Body-Building Strength of Choicest Hops and Malt stored up in this unadulterated, uncolored, almost predigested LIQUID-FOOD-TONIC." The product is stated to contain Alcohol, 3 Gm. and "Hop extractives" 0.20 Gm. The product is stated to be "a nutritive tonic" and "not a beverage" and to be indicated in the treatment "of nursing mothers, anemic men and women, convalescents from wasting diseases and the overworked and undernourished." Since Malt-Nutrine is to be used as a medicine and not as a beverage, it becomes subject to consideration by the Council on Pharmacy and Chemistry. The Council held that it is unacceptable for New and Non-official Remedies because (1) the therapeutic claims made for it are unwarranted and (2) the name is therapeutically suggestive. (Jour. A. M. A. Dec. 25, 1926, p. 2177.)

## BOOK REVIEWS

### BOOKS RECEIVED FOR REVIEW

**SYMPTOM DIAGNOSIS.** Wilfred M. Barton, A.M., M.D., F.A.C.P., and Wallace M. Yater, A.B., M.D. 851 pages. New York: D. Appleton and Company, 1927.

**THE SURGICAL TREATMENT OF GOITER.** Willard Bartlett, A.B., M.D., D.Sc., F.A.C.S. Foreword by Charles H. Mayo, M.D. 365 pages. Illus. Cloth \$8.50. St. Louis: C. V. Mosby Company, 1926.

In reading this book one is reminded of a statement made by John B. Deaver. When a young physician starts practice he acquires experience. After some years he adds judgment to experience and after many years he acquires wisdom. Dr. Bartlett has evidently attained the third degree.

All phases of the goiter question are covered. The writer not only draws on his own ripe experience but quotes freely from the opinion of others.

The chapters on Pathology and the Heart are treated by other writers.

Those on the preparation of the patient and anesthesia are of special interest.

Painstaking attention to details marks the author's operative technic. One may characterize the book as a whole as detailing the most approved methods of the operative treatment of goiter.

F. J. SAVAGE, M.D.

**HER SON'S WIFE.** Dorothy Canfield. Price, \$2.00. Pages 302. New York: Harcourt, Brace and Co.

In a recent editorial in the Journal of the American Medical Association, attention is called to the fact that the chiropractor has just made his debut as a character in literature in Dorothy Canfield's recent novel "Her Son's Wife." The regular physician has long been a favorite character in literature but the appearance of the chiropractor in fiction is apparently an innovation. The author, however, does not commit herself by designating him as a chiropractor but merely refers to him as "the quack doctor, Dr. Pell." So the reader makes his own deductions from the diagnosis of "one little corner of bone slipping past another" and the treatment of massage and electrical applications over the spine, although there is no reference to any spinal adjustment.

The story is that of a widow who has raised her only son to manhood only to virtually lose him through his marriage to a girl of a very inferior type. Lottie is pretty, passionate, shallow, selfish and inefficient with nothing in common with her serious minded mother-in-law. The older woman devotes herself to the child, a little girl, known as Dids, who seems to resemble her dead grandfather. But the grandmother finds herself thwarted on every side by Lottie's ideas and influence and it seems as if the child must grow up into a replica of her mother. But Lottie, who is greatly bored by life, turns to ill health as a diversion, and says, "I wish I could get a decent doctor. Dr. Dewey takes no interest in you unless you have a broken bone." So she

calls Dr. Pell because "he has helped Mrs. Flacker's cousin's wife so much." He comes to the house and displays a magnificent physique and a magnetic personality which greatly impresses the patient. He carefully scrutinizes both Lottie and her mother-in-law and finds that the former is easily amenable to any suggestion of symptoms and at the same time divines that the older woman, for some reason, will not be antagonistic to either himself or his methods.

The reason for this is that Mrs. Bascomb realizes that a life of invalidism for Lottie will remove her influence over Dids and allow the child's life to develop along the best channels. Dr. Pell assures Lottie that at some time she must have slipped and hurt her back and says that the pain in her feet must "come from nerves running down the back-bone." He then comes regularly three times a week to give her treatments. On Tuesdays he brings a complicated electrical apparatus, giving off a green fire, and runs a glass tube up and down her spine. Thursdays were vibration days and out of a velvet lined case came a little rubber headed hammer which pounded her back until she was breathless. Saturday was the day for psycho-manual manipulation, which was massage up and down the back by the doctor's own soft, warm hands anointed by a smooth, creamy, fragrant ointment. For this he always lowers both the window-shades and his voice and following the treatment Lottie lies for hours in a delicious lassitude. She liked Saturday best. As for the doctor, his monthly check gradually began to look as regular and impersonal as the dividend from an investment.

During all this time Mrs. Bascomb is suffering great agony of spirit for her passive part in the deception but feels that the child is worthy of the sacrifice of the mother, the old story of the struggle of the older generation to give the younger one a chance. Some doubting spirits may question the financial marvels accomplished by the older woman's salary as a school teacher. Others, especially physicians, will wonder that the strength of a middle aged, frail woman could be equal to the house-work for a family of four and the greater care of an invalid as well as the exacting duties of the school-room; but these are minor details and do not seriously detract from the book.

The story is written in Dorothy Canfield's clear and fascinating manner and will prove to be of benefit and interest to any serious minded reader, either lay or medical. The character of Dr. Pell is treated in a most matter-of-fact and unprejudiced manner but his quackery is described so accurately and openly that the reader must be consciously or unconsciously influenced toward regular medicine by the subtle exposé of the quack. The story seems to put the quack in his proper place in the sun and should be especially interesting reading even to a physician. At the same time the placing of "Her Son's Wife" in the hands of the laity should exert considerable influence against the cults and because of its easy and interesting style should be of even greater value than the popular "Medical Follies."

MARGARET WARWICK, M.D.

**SURGERY OF NEOPLASTIC DISEASE BY ELECTROTHERMIC METHODS.** George A. Wyeth, M.D. 316 pages, 137 illustrations. Price, \$7.50. New York: Paul B. Hoeber, Inc., 1926.

Dr. Wyeth's book on Surgery of Neoplastic Disease by Electrothermic Methods should be in the library of every surgeon. This volume contains an explanation of the different types of currents and the machines that deliver them. In addition the author has clearly outlined the use of the different currents. Lesions of the various anatomical divisions of the body are grouped and their treatment described in detail. This book is profusely illustrated so that any surgeon who cares to study it should get a working knowledge of electrothermic methods as used in the practice of surgery.

Electrothermic methods of treating neoplastic disease have not been used to their fullest extent by all surgeons. Until the publication of this book we did not have a practical, comprehensive article on the subject.

The contents are divided very logically into chapters, the illustrations are listed and the book contains a very complete index, so that as a reference volume it should be very useful.

GILBERT J. THOMAS, M.D.

**HYGEIA OR DISEASE AND EVOLUTION.** Burton Peter Thom, M.D. 107 pages. New York: E. P. Dutton & Company, 1926.

A small volume which looks at medicine and the progress of the world from a far distance, seeing the entire progress of humanity from the perspective of civilized advance. He observes rightly that the lower forms of animal life are free from disease in large measure: that as one advances in the scale of animal life one finds more and more increase of disease, especially parasitic disease, the living of one animal on another; sometimes without injury to the host, other times with injury. Man, the highest of all forms of life, is subject to the most varied types of disease. "It is probably that all, or nearly all, of the killing diseases were established pathologic entities at the dawn of history. The possible exceptions were some of the epidemic diseases, although these are probably much older than is supposed. As civilization advanced the number of man's disease enemies increased and whenever a new disease appeared, its toll of life was invariably heavy, until, after many generations, a certain degree of immunity was established. The untempered violence of some of these diseases, especially when they assumed epidemic proportions, leaves us in wonder that humanity has survived their terrific assaults."

"For thousands and thousands of years—at least five hundred thousand, possibly a million, mankind has inhabited the earth. During that time he has been threatened with many perils, just as he is now. But he has succumbed to none of them. He has overcome them all." So will he overcome those that may threaten him in the future. Whatever problems arise, all these problems will be met and solved, and in the solving of these circumstances—whether overpopulation, undernourishment, insufficient coal, or diseases—there will

arise the "Golden Age" such as no past life has ever experienced.

DANIEL H. BESSESEN, M.D.

**MEDICAL FOLLIES.** Morris Fishbein. \$2.00. New York: Boni and Liveright, 1925.

This instructive and entertaining book is not new, having been published in 1925, but it is being so widely read and it can be of such great value to the medical profession that it merits consideration at the present time. It is written by Morris Fishbein, editor of the *Journal of the American Medical Association*, and Hygeia, popular lecturer, and author of many medical articles in current magazines and newspapers.

It is a treatise of many of the medical subjects which are, at the present time, being so widely discussed by the general public. It is written in a dignified yet simple style which may be easily read and appreciated by the lay mind. All of his statements are explained and verified by scientific facts and reasons. He starts his discussion with a description of one of the first quacks, one Elisha Perkins, who practised upon a gullible public as early as 1760 by means of his famous "tractors." He then takes up Homeopathy, Osteopathy, Chiropractic and Abrams' Electrical Reactions. The history of each of these cults is given, together with their method of operation and the reasons for their short life as compared to that of regular medicine. He says that people go to these cults because "some friend, who has been aided, urges them to go and because physicians fail them."

Another chapter is devoted to "Fads in Health Legislation" and shows the futile and ridiculous attempts of governing bodies to protect health by laws. "Birth Control" is discussed from the scientific viewpoint and considered as an unsolved problem because of the lack

of a sure yet safe contraceptive, and "Rejuvenation" is shown to be a fallacy. "Antivivisection" is treated in a most able and convincing manner and the necessity of animal experimentation to the welfare of mankind and to the progress of medical science is proven, and he says, "Shall we permit man to die or to suffer mutilation to spare the feelings of the white mouse? Isn't it a question of sparing the hyperesthetic sensibilities of some idle woman rather than the duller sensibilities of some lower animal?"

Bernarr McFadden and his physical culture magazines with their worship of muscle and their sex appeal are disposed of in a highly entertaining and satirical manner. Another chapter is devoted to "Medicine and the Press" where the reticence of the medical profession toward the press is justified by numerous quotations of misstated facts showing that the press can not be depended upon to report medical subjects in an authentic manner. He closes with a chapter on "The Science of Healing" in which he considers the romance and dramatic appeal in the development of modern medicine, saying, "The growth of scientific healing is as romantic a series of tales as ever captured the attention of a novelist; it is filled with dramatic incident."

Medical Follies should be read by every physician, his wife, every medical student, nurse and associate of the medical profession, and these people, having acquired a first-hand knowledge of it, should do all in their power to bring it into the hands of the laity by placing it wherever several books are gathered together, as libraries, reading rooms and waiting rooms. Its perusal by the general public will bring a great deal of order out of the chaos of misunderstanding of medical subjects and problems and will give greater understanding, prestige, tolerance and confidence to the medical profession.

MARGARET WARWICK, M.D.

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